The Builder.

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"London Streets and Buildings" Bill.

THE proposed Bill of the London County Council under this title, so far as we can judge from a necessarily rapid perusal of it, appears to be, in the main, a good practical measure, drawn up so as to provide as far as possible for all contingencies which can be legally dealt with, and its machinery seems less complicated than might have been expected in a Bill designed to deal with such an immense variety of work and such a number of conflicting interests. A certain degree of elasticity in its working is provided for in the insertion of clauses empowering the Council in various instances and under special circumstances to relax the letter of the general regulations.

The subject of the formation and widening of streets properly comes first in the Bill. In providing that no person shall commence to lay out any street for carriage or foot traffic without having first obtained the sanction of the Council, the "commencement" of a street is prudently defined "as indicating the course or direction thereof either by erecting posts or a fence or other boundary or by laying down lines of kerbing or removing the surface of the ground;" thus providing against that appearance of a kind of right in virtue of commencement of work which is sometimes not without its influence in a court of law. It is not surprising to find, after the policy which the Council has already displayed in regard to gates and bars, that the idea of semi-private streets is entirely discountenanced. Among the grounds for refusing to sanction a plan of a street are named, when the street, being a carriage-way, does not form a connexion between two streets of similar class, and when any street is proposed to be formed "without being open at both ends from the ground upwards." As far as the latter provision refers to a street closed by a wall or a building at one end we should of course entirely concur in it, on sanitary grounds; but with that exception both these are what we should call doctrinaire clauses. They would prevent for all time that occasional formation of retired and semi-private streets which is one of the privileges most valued by wealthy residents in a great city, and the present existence of which to a certain extent is one of the agreeable features of London; and there are certainly special occasions when the enclosure of one end of a street by an open railing (so as not to interfere with ventilation) would be a concession which might be made without any detriment to the general public, and to the great advantage of the tenants of the street. But these days are over, and the interest of those who traverse the streets is to be considered solely, to the entire exclusion of the interests of the residents in the houses which line them. Are not these latter also a portion of "the public?" We do not see any provision for the occasional relaxation of this regulation at the pleasure of the Council, but such a provision might well have been made. The provisions as to the width of streets seem on the other hand to err on the side of too little liberality. The average requirement for a carriage-way is 40 ft. clear, or 20 ft. from the centre of the roadway to the nearest external wall or fence boundary; but when the Council shall be of opinion that the special importance or length of the street render it desirable "in the public interest" to increase this normal width they may require an increased width, "but nothing in this section shall authorise the Council to require a greater width than 60 ft." In whose interests are these limitations inserted? Certainly not "in the public interest" in the true sense of the words. We hope these clauses will be attacked in Parliament; they are almost ludicrously inadequate. The whole thing is turned the wrong way about. Forty feet is a sufficient width for certain classes of streets, no doubt, but to take it as the average width to be contemplated is absurd; and where the Council are to be empowered to require a greater width, why have they tied their hands to 60 ft.? Think of the noble wide streets of Paris, with their ample foot pavements, and see what such a regulation reduces the future of London streets to. One of the worst points about the general aspect of London is the miserable narrowness of the majority of her streets, an evil which the Council are thus proposing to perpetuate by Act of Parliament. What makes it more absurd is that it is universally held by all who have considered the subject of the ratio of height to width in streets, that a street should not be lined with buildings the height of which is greater than the space which separates them, and this Act contains a clause limiting the height of buildings (except under special permission) to 75 ft., the Council have actually limited the width of streets to 60 ft., and this width to be required only in special cases. The passing of such regulations would be disastrous as regards all future attempts to give greater dignity, beauty, and spaciousness to London streets; we say beauty, for the best architectural design is half thrown away when inserted in a street too narrow for it to be properly seen. One can hardly be surprised at these provisions, for the London County Council after all is only a large vestry, and has the typical vestry's indifference to mere questions of dignity and stateliness in cities; and we presume these narrow ideas on roadways are framed on the vestryman's notion of economy in compensation for property taken for streets, and in street-cleaning afterwards; but the passing of such clauses would be most detrimental to the future of London, and we hope the Council will hear some plain criticisms on them from those who know better.

On the other hand, while the Council will not leave themselves the liberty to allow us streets of decent width, we observe that they are careful to provide a clause (12) empowering them to consent to erection or retention of buildings within *less* than the prescribed distance from the centre of the roadway. They put the width of a road as low as can possibly be accepted, and then retain the right to restrict it still further. All this will not do, and a determined stand ought to be made against it.

The power to decide on the naming of streets, and to re-name and re-number them where necessary, and the regulations in regard to this subject, though they are likely to be unpopular, and the exercise of the power generally causes a good deal of public irritation, are we think quite necessary. The naming of streets is properly a matter for the municipal governing body to decide; it is so in other capitals, and a good deal of trouble would have been saved if it had always been authoritatively supervised in London.

The provisions for open spaces and the

height of buildings appear to be adequate, but it cannot be said that the rule for determining the relation between the height of a building and the width of the open space at the rear of it is very clearly expressed:—

"(4) The relation between the height of any new building and the space required in the rear thereof shall be fixed and ascertained as follows:—

(*a*) A line (hereafter referred to as 'the horizontal line') shall be drawn at right-angles to the roadway formed or to be formed in front of the building and through or directly over a point in front of the centre of the building;

(*b*) The horizontal line shall be produced to intersect the boundary of the open space furthest from the said roadway;

(*c*) The horizontal line shall be drawn throughout at the level of the pavement formed or to be formed in front of the centre of the building unless the site of the building incline towards the roadway or site of the roadway in which case the horizontal line shall be drawn directly over the said point in front of the centre of the building at the natural level throughout of the ground at the boundary of the space furthest from such roadway where such boundary is intersected by the horizontal line;

(*d*) A second line (in this part of this Act called 'the diagonal line') shall be drawn in the direction of the building above and in the same vertical plane with the horizontal line and inclined thereto at an angle of forty-five degrees and meeting the horizontal line where it intersects the boundary of the space furthest removed from such roadway."

It is to be presumed that the height of the building is to fall within the diagonal line, but no further explanation is given; if the diagonal line is to be drawn "in the direction of the building," from the centre of the boundary of the space in the rear, then "meeting the horizontal line" at that point is a misleading expression, as it is drawn from that point. We can imagine that clause causing much searching of heart among the ranks of speculating builders; what is generally intended by it is obvious enough, but it certainly might have been more clearly expressed. Nor do we very well understand the provision in regard to the courts and shafts of a building:—

"Whoever after the passing of this Act shall construct for purposes of light and air a court or shaft enclosed wholly or partly on four sides shall, if the depth of such court or shaft measured from the level of the ceiling of the ground story to the eaves or top of the parapet exceed the length or breadth of such court or shaft provide a clear opening or openings for ventilation having a total sectional area of not less than 50 ft. the whole of which opening shall be within 20 ft. of the level of the pavement of the adjoining street and such openings shall at no time be closed otherwise than by open iron doors or grids whereof the collective openings shall be equal to at least three-fourths of the area of such doors or grids."

What is the meaning of this it is difficult to understand. Are the openings for the ventilation of the court or shaft? And if the court or shaft is within the building, how are the openings to introduce ventilation? Or are they for the ventilation of the building? The whole thing is most vague. Another clause we notice in this section is that no one shall rebuild, alter, or enlarge houses so that they stand wholly or in part back to back "without the consent of the Council"; a liberty of concession which is not desirable, because it is one that ought never to be granted. The section concludes with a clause providing that no building shall exceed in height the width of space to the building on the opposite side of the street; but, as before remarked, this clashes with the 75 ft. height limitation and the limitations as to width of street; the two might have been drawn up by two different bodies.

In the section on the construction of buildings we note that while the old provision that woodwork in an external wall shall be set four inches back from the face of the wall is retained as a general regulation, it is provided that it shall be lawful for the Council by by-law to exempt from this provision oak, teak, or other wood, "provided the work be constructed to the satisfaction of the District Surveyor." This is an innovation which has long been called for. The time-honoured requirement that all beams, bressummers, &c., should have a bearing of at least four inches on the walls might very well have been altered to six inches as a general requirement, with power to relax it in case of small work. There are certainly many cases in which four inches bearing on the walls is not sufficient for the best construction, but builders of a certain class will always avail themselves of the legal liberty to reduce it to this. The requirement that every building above 60 ft. in height shall be provided on the stories above the 60 ft. with such means of escape in case of fire for the persons dwelling or employed thereon "as can be reasonably required under the circumstances of the case," is at all events a recognition of one important requirement in lofty buildings, though the clause certainly cannot be said to be very drastic in its wording. The regulation about habitable rooms over stables also comes short of what ought to be required: "the floor shall have in every part not occupied by a joist a layer of concrete pugging of good quality 3 in. in thickness." The provision ought to be that the floor should be a solid one of concrete and iron, or at all events a solid concrete floor, however constructed, shutting off the stabling from the apartment over it as completely as a wall.

Under the heading "Construction" we notice also the exemption from the rule as to the limitation of cubical contents to 216,000 cubic feet, any buildings used wholly for the manufacture of the machinery and boilers of steam vessels, or for a retort house for the manufacture of gas, or for generating electricity, provided that such building consist of one floor only and be constructed of brick, stone, iron, or other incombustible material throughout, and shall not be used for any other purpose than those specified. Such buildings, however, are required to be situated more than two miles from St. Paul's Cathedral. The Council, however, reserve the right to license larger cubical contents in special cases, when they are satisfied that such extension of the cubical space is necessary, and that proper arrangements have been made for lessening danger from fire, "so far as reasonably practicable." This is a proper provision, as cases may certainly arise in which it may be desirable to make an exception to this otherwise salutary rule, which has already been the cause of difficulty in some instances.

The sections as to rights of adjoining owners and as to dangerous structures are clearly worded. A section in regard to "dwelling-houses on low-lying land" is important as dealing with a subject which has caused many difficulties in drainage in certain quarters of London. It is now proposed that it shall not be lawful for any person to erect any building which is to be used wholly or in part as a dwelling-house, or adapt any existing building as a dwelling-house, which is so situated as not to be drained by gravitation into an existing sewer of the company, except by the special permission of the Council and in accordance with such by-laws as the Council may prescribe for buildings so situated. One of the sub-sections of this clause empowers the Council to prescribe the level at which the under side of the lowest floor of such a building should be formed. No suggestion is made as to the details of the manner in which the site is to be treated where the level of the lowest floor may be ordered to be kept above the ground-level; that we presume is regarded as a matter to be considered according to the circumstances of each case; but the general clauses on this subject are certainly to be approved.

It is not quite clear whether the first clause in the section relating to "Superintending architect and surveyors,"—"The Council may for the purpose of aiding in the execution of this Act appoint some fit person to be called the 'Superintending Architect of Public Buildings'"—implies the creation of any new professional officer, but we presume it is only a formal confirmation of the existing power of appointment. One of the clauses in this section provides that where by reason of any emergency any work is required to be done immediately and before notice can be given it may be done, on condition that notice is given twenty-four hours after it has been begun. This is a reasonable provision, and in general there seems to be a desire throughout the Act to avoid tying people up too closely in the bonds of red tape. As to the question about which there was a discussion at the Institute the other day, in regard to the hardships involved to builder and building-owner in not notifying a contravention of the by-laws till after it has been carried out, and the possibility of the District Surveyor notifying on the basis of furnished plans, no suggestion is made, the Council probably being of the same opinion which was expressed in the course of the discussion alluded to, that a magistrate can take no action against a breach of the law until the breach has actually been made. After all, it is possible for any builder to know whether he is breaking the law, and perhaps the most suitable answer to that kind of complaint is the one we once heard made by a municipal official in response to an appeal as to the trouble and expense he was causing—"People who do wrong generally do get into trouble."

In regard to details of wording there may be occasion for further criticism of this Act than we have been able this week to go into. In the main, as we have said, it seems a well-worded and a practically workable Act, the great defect in it being the provision for permanently fixing on London the defect of narrow streets.

ABOUT THE FALL OF A FACTORY CHIMNEY.

During the disastrous gale of November 18, which caused so much destruction to shipping and loss of life on the British coasts, a factory chimney 35 yards high was blown down at Huddersfield, killing two men who were working in an adjoining shed. From the evidence produced at the inquest it appears that the chimney, which was square on plan and constructed of brick, was erected nineteen years ago, but was at that time only carried up to a height of 25 yards. The chimney was 6 ft. 1½ in. wide at the base, and was carried up vertical to a height of 21 ft. 6 in., and 18 in. in thickness, including a firebrick lining, which was built in as part of the structure to a height of 11 ft. From the level of 21 ft. 6 in. above the ground, the chimney was of 14 in. brickwork, and was "battered" to the summit, where the width was 4 ft. 6 in.

About two-and-a-half years ago, a greater draught being required, the chimney was raised 10 yards more, the new part being of 9 in. brickwork, and "battered" to 3 ft. 6 in. at the top.

The original chimney had therefore a height equal to about twelve times the width of the base, while the raised chimney had a height equal to about seventeen times the base. The safe proportion for such a structure is considered by good authorities to be ten to one. The place where the fracture took place was 32 ft. above the ground-line, and was abutted to a height varying from 30 ft. to 40 ft. by adjacent buildings on three sides.

Mr. John Waugh, C.E., of Bradford, who had been appointed assessor by the Coroner, under an authority from the Home Secretary, attributed the disaster partly to the height of the chimney being too great as compared with the width of the base, which should have been 10 ft. instead of 6 ft., but principally to the fact that it was abutted against by the walls and roofs of the adjacent buildings on three sides, which gave rigidity to the structure for a height of 30 ft. to 40 ft.; whereas such a chimney should be perfectly free to oscillate in all directions when shaken by the wind. The chimney was also weakened to some extent by having openings near the base on three sides, two of which

were 4 ft. 3 in. high by 1 ft. 5 in. wide, and the other 6 ft. high by 1 ft. 10 in. wide. The chimney also had a decided cant in the direction in which it fell, either from the action of the wind upon it or from a subsidence in the ground.

Having these data to go upon we can with tolerable accuracy calculate the force that was required to overturn the chimney about the point of fracture, which we take as 32 ft. from the ground, at which height the width would be 5 ft. 9 in.; and the area of one face from this point to the height of 75 ft. is

$$43 \times 5\tfrac{3}{4} = 248 \text{ sq. ft.}$$

The area of one side of the upper part, or addition, is

$$30 \times 4 = 120 \text{ sq. ft.,}$$

so that we have a total of 368 sq. ft. of surface acted on by the wind when blowing directly upon one side.

The cubical contents of the 14-in. work is 796 cubic feet, and of the upper 30 ft., or 9-in. work, is 293 cubic feet. Taking the weight of the brickwork as 1 cwt. per cubic foot, we have for the total weight of the chimney above the point of fracture

$$1{,}089 \text{ cwts.} = 121{,}968 \text{ lbs.}$$

This mass would have a leverage of half 5 ft. 9 in., or 2 ft. $10\frac{1}{2}$ in. at the point of fracture; so that the *moment* of resistance taken about that point is 350,658.

If p is the pressure per sq. ft. of surface which would just overcome the effect of the weight, then we have for the *moment* of the pressure on one side of the chimney supposed to act at its centre of gravity (which is 33 ft. above the point of rupture)

$$p \times 368 \times 33 = p \times 12{,}144.$$

Equating this with the *moment* of resistance, we have

$$p \times 12{,}144 = 350{,}658$$

$$\text{or } p = 28{\cdot}87 \text{ lbs.,}$$

which is the pressure per ft. on the surface which would just be on the point of causing rupture. This would give a velocity of 75 miles an hour for the wind.

Scientific observations on the force of the wind at a station 200 ft. above the base of chimney, showed that on that day the wind pressure registered was 18 lb. per square foot, and the velocity of the wind sixty miles an hour; but the observer considered that the pressure would be greater down in the valley where the chimney stood. It is reported, however, that on December 12 a pressure of 37 lbs. per foot was registered at Greenwich Observatory, although the force of the gale on that day was rather less than on November 18; and this would be much more than sufficient to overthrow such a structure.

Mr. Waugh was of opinion that a properly-built and proportioned chimney ought to be able to resist a pressure of 50 lbs. per foot, or nearly double that which we have shown would cause this chimney to fall; but this would only be produced by wind moving at the rate of 100 miles an hour, a velocity never approached in this country, although one of 120 miles was recorded during the hurricane in Florida a few weeks ago.

NOTES.

WE print in another column a letter from an architect (Mr. Swinfen Harris) *apropos* of the Bath Pump-room competition, repeating the view which other correspondents have occasionally set forth, that unless the decision of the assessor in an architectural competition is absolute and binding there is no use in having an assessor; and we received the other day a private and strongly-expressed letter to the same effect from an architect who we conclude (though he did not say as much) is the author of the design selected by Mr. Waterhouse in the Bath competition. We have before endeavoured to persuade architects that this view is hardly reasonable, unless the assessor has accepted the office on those terms. It is open to any eminent architect who is invited to act as assessor in a competition to decline to act unless he has the written undertaking of the Committee that they will abide by his decision absolutely. It is, however, very possible that in that case he would not be engaged. As we have before said, it cannot be expected that the people who are going to pay for and use the building should surrender their right of choice absolutely to an outsider.* The argument that in that case the appointment of an assessor is of no use is quite a mistake. The probability is that the Committee will make a great deal better choice with the assistance of the assessor's advice, and that in most cases they will accept his advice, believing that it is the best thing they can do. Occasionally they will not, and then we hear the cry, "What is the use of an assessor?" The use has been that in a majority of cases the Committee have accepted the assessor's award; and even where they have not, it is very possible that without him they would have made a still worse choice. The assessor has certainly been an influence, in spite of this occasional departure from his ruling; if architects try to set up the demand that in all cases the assessor shall have absolute right to impose his choice on the Committee, the result will be very likely to put an end to the assessor altogether; and although it is probable that an able architect acting as assessor would select the best design, it is not by any means certain that he would; he is only mortal; and people of average sense and education *will* claim to have some opinion of their own as to what they are going to spend their money on. What we do hold, however, is that every one who is invited to act as an assessor should first distinctly ask the Committee, "Do you wish me to make the award, or do you wish me only to report and advise?" And in the former case he should have a distinct understanding that his award will be upheld. But he may do a great deal of good in the latter case also, with no such formal stipulation, if he is dealing with an honest and well-intentioned Committee.

* We are not saying this as any defence of the special case of the Bath competition, which seems to us to be thoroughly bad: we are considering only the general principle.

PROFESSOR OVERBECK'S pupils have celebrated his "Jubilee" by dedicating to him a "Festschrift" consisting of eighteen important archæological monographs. Two out of these relate to the Parthenon marbles. Dr. Bruno Sauer, to whom we owe so much as to the exact position of the pediment figures, publishes two recently-discovered fragments, both of which are now in the Acropolis Museum. One is a female figure from the nineteenth metope, on the south side of the temple, easily identified by comparison with Carrey's drawings. It is the finest draped figure that remains from the metope series. The second fragment is that of a colossal female head, of pentelic marble. It bears clear marks of having been fastened behind, and Dr. Sauer attributes it to the east pediment. So very little remains to us of the centre group, that the smallest contributions must be thankfully received. Of the six figures which Dr. Sauer's previous investigations on the attachment marks prove to have occupied the centre of the pediment, we have only three actual fragments remaining, the torso of a male figure, the present fragment of a head, and a female hand carrying the remains of a torch. The head bears obvious traces of having worn a metal crown and a veil, and to be brief, Dr. Sauer inclines to think it belongs to a seated Hera on the right side of the composition. The second paper on the Parthenon is by Professor Michaelis, and deals with the still vexed question of the central group of the eastern portion of the frieze. The old interpretation, *i.e.*, that this slab represented the offering of the Panathenaic peplos, has of late years been discredited in favour of the newer hypothesis that the scene represented is a priest laying aside his himation, which he gives to an attendant boy. We may note that the British Museum authorities, Sir Charles Newton, and later Mr. A. S. Murray, have always adhered to the older interpretation. Professor Michaelis hopes to set the question at rest by a very simple observation. The priest, he holds, *has* given the boy his himation, but it is not the carefully-folded object that is being passed from hand to hand. That is the peplos. But the boy has already over his shoulder a long heavy himation, and as this is considered unappropriate to his youth and position, it must, according to Professor Michaelis, belong to the priest. He had not two cloaks to part with, so the large folded one must be (*i.e.*, if the boy may not have a cloak of his own) the peplos itself.

A MOST interesting article is communicated by Mr. C. Davison, the well-known seismologist, to this month's *Geological Magazine*, dealing with the results of observations and experiments on the fluctuations in the level and rate of movement of ground-water on the Wisconsin Agricultural Experiment Station Farm, and at Whitewater, Wisconsin. These results are of more than local interest as leading up to certain general principles concerning the rise and fall of underground water. The experiments were made in fifty-four wells sunk for the purpose. A simple recording instrument was employed in each, consisting of a copper float connected with the short arm of a lever, the long arm of which carried a pen which, on a scale three times the natural size, traced the fluctuations in the water-level on paper moved by clockwork. By this means the slightest movement was detected. Summarising the results, we may say that as a general tendency the water-level stood highest under the highest ground, but there were certain exceptions to this rule after prolonged drought followed by heavy rains. This observation is not new, though it serves as a general confirmation of the works of others. The rate at which the ground-water rose and fell varied between rather wide limits, but, speaking generally, a given rise occupied a much shorter time than the same fall. After a fall of rain it was ascertained that the rise of the ground-water took place almost immediately in the shallow wells, but two or three days were required before the level was affected in the deeper ones. The experiments also showed—and this seems to us to be the most important conclusion—that the rate at which the water-level falls is much greater when the barometer is rising than when it is falling. During the three years 1888-90 the mean daily fall was 0·224 in. with a rising, and 0·001 in. with a falling barometer. Moreover, the water-level fell more rapidly during the day than during the night, the average fall for a number of wells being 8·583 in. per 1,000 day-hours (6 a.m. to 6 p.m.) and 1·309 in. per 1,000 night-hours (6 p.m. to 6 a.m.). It need hardly be mentioned, in face of the foregoing, that a rise in the barometer is also associated with a diminution in the rate of flow of water from tile-drains, springs, and artesian wells. We cannot enter into the discussion as to the causes of these phenomena, but they are of the highest interest to the student of certain water-supply questions; and we trust that the work so ably carried out by Professor King at the American Experiment Station alluded to, will be continued for some years to come. It cannot fail to shed much light on the flow of underground-waters, a subject still very imperfectly understood, in spite of the researches of the Committee of the British Association appointed to inquire into the matter.

THE case of Martin *v.* Price, decided on Tuesday by the Court of Appeal, shows the expense to which parties may be put by a Judge who with well-meaning zeal tries to conclude a dispute by a short cut. The plaintiff proved before Mr. Justice Kekewich

that his ancient light had already been partially diminished by the defendant's new buildings, and would be still further lessened as the latter grew higher. The Judge took the bull by the horns, and awarded the plaintiff 120*l.* for damages, past and prospective. As the Court of Appeal pointed out, it is a matter of doubt whether a legal tribunal can properly give damages for a prospective injury. In truth, it is difficult, if not impossible, to assess them. The Court of Appeal, therefore, allowed the appeal, granted an injunction to prevent the defendant from further obscuring the plaintiff's light, and ordered an inquiry before an official referee as to the amount of the damages already sustained. If Mr. Justice Kekewich had adopted the same course, which is the usual one, he would have prevented the costs of an appeal, and have done justice in the ordinary way. To give a rough-and-ready decision such as he did is all very well for an arbitrator against whose decision there can be no appeal, but is very unwise on the part of a Judge, unless the parties consent to abide by such a decision in order to prevent further litigation.

THE Railway Reform Association, and other bodies who insist upon the necessity for wholesale reductions in railway rates, will not derive much encouragement from the perusal of the current half-year's traffic returns. Of course, these are not yet complete, but a most gloomy outlook is presented by the figures for the five months ending December 3. The following decreases in gross receipts are shown—

	£.
Great Eastern	157,072
Great Western	210,740
Great Northern	250,644
Manchester, Sheffield, & Lincolnshire	255,936
London and North-Western	435,916
Midland	820,649

This is truly a most disastrous state of affairs, for it is certain that working expenses have not decreased in anything like the same degree. Various public bodies have passed resolutions urging reductions in rates, the Association we have already alluded to declaring their conviction that unless the railway rates for coal are materially reduced, "another and still more disastrous lock-out in the inland colliery districts is inevitable." Railway directors and officials, in common with coal owners and manufacturers, will have to direct their attention to regaining lost trade; but it is hardly likely that they will be prepared to make any very substantial reductions in their charges in order to effect this. A contemporary states that in a town within fifty miles of London, with a population of 150,000, the local gas company has made a contract with a firm in Belgium for the supply of coal for twelve months; and this may be taken as a specimen of the natural results of such suicidal struggles as the late coal war. These things should have great weight in determining the attitude of the members of the new Conciliation Board towards the questions with which they will have to deal.

THE Report to the Local Government Board by Mr. Evan Evans on the sanitary condition of the town of Amlwch, and on prevalence of "fever" there, tells the usual story in such cases in regard to water-supply, drainage, and disposal of refuse. As to water-supply we read that the town is almost entirely dependent for its supply of water on shallow dip-wells, situated on the outskirts of the town, so that water for drinking purposes has often to be conveyed in buckets and carts a distance of a quarter of a mile or more to the dwelling. From their situation these dip-wells are fairly removed from the danger of becoming specifically contaminated with the drainage of yards, middens, and privies, and the well-waters therefore, if properly protected, would be of good quality. But there is utter disregard of the most elementary precautions in this respect. The wells are merely dry-steined, and are unprotected against surface washings; moreover they are uncovered and are often freely resorted to by animals. In regard to sewerage we read that, with the exception of some private drains which empty into the Afon Wen (out of which river water is taken for drinking to a certain extent), the only attempt at sewering the town has been in connexion with a number of houses around the Castle Hotel. The only other sewer of any importance drains a few houses in Dinorben-square and the vicinity, and empties itself into the Afon Goch near the bridge. Occasionally small rubble drains are placed in the yards, and, passing underneath the houses, discharge on to the street in front, but, on account of the nuisance resulting therefrom, owing to the absence of roadside channels, they are mostly purposely blocked up, the slop water which used to be discharged into them being thrown into the garden, on to the refuse heap, or over the wall into an an adjoining field. It is in regard to excrement disposal that, as usual, we find the tale worst:—

"In the houses which are provided with means of drainage, water-closets are often found; but their soil-pipes are generally unventilated, while the closets themselves are sometimes placed in improper positions. In one instance a hand-flushed and untrapped long hopper-closet was found placed in a small unventilated recess leading out of a bed-room, the soil-pipe discharging under a grating in a urinal outside. The usual method of excrement disposal, however, is by means of privies, which are almost invariably in a filthy condition and often dilapidated, while their contents are often allowed to accumulate for a year or more before removal. For many of the smaller cottages there is not even an apology for a privy, and the male inhabitants have to resort to the fields, while the excreta of the old and infirm and of the women and children are passed into pails, and have to be thrown on the refuse heap or into the neighbouring brook. These conditions are common throughout the whole town, and many were the complaints concerning this want of privy accommodation. The Rural Sanitary Authority do not undertake the removal of house refuse, which, in the common absence of ashbins and ashpits, is mostly piled up in the garden or against the walls of the dwelling."

We observe the same conditions exist in every rural district where the Sanitary Authority does not undertake the removal of the contents of privies. The people, if left to themselves, have not apparently spirit or sense to attend to this. It ought to be made legally compulsory on Rural Sanitary Authorities to undertake it.

THE BISHOP OF LONDON has issued a Commission to consider the expediency of uniting the benefices of St. Michael, Bassishaw, and St. Lawrence, Jewry, to which latter is already joined St. Mary Magdalen, Milk-street. Of the former church we gave a short description in a "Note" on March 4 last, when a faculty had been granted for removal of the remains beneath the floor. At a subsequent sitting (June 5) of the Consistory Court, the Chancellor of London made an order to suspend the excavations, which, it was found, could not be continued with safety to the fabric in its present condition. So the vestry passed a vote for union, since to place the structure in proper repair would cost about 5,500*l.*, to meet which a rate would fall upon some seventy or eighty parishioners. The church of St. Lawrence, designed by Wren, was built at a cost of 11,870*l.*, exceeding that of any other City church by him.* In the old church were buried Sir Richard Gresham (1549); and, according to Timbs's "Curiosities of London," Anne Boleyn's father, Thomas, the Earl of Wiltshire and Ormonde, and Richard Rich, mercer (1469), ancestor of the Earls of Warwick. Stow and Weever mention the interment of Geffrey Boleyn (grandfather of Sir Thomas Boleyn), who was elected Lord Mayor in 1457; the Haliday monument commemorates William Haliday's widow Susannah, who married Robert, Earl of Warwick. The late George Godwin, in his "Churches of London," commends the east end, in King-street, of Wren's fabric; he writes: "The details of this façade are boldly designed, and display a purity of feeling almost Grecian." Its interior was adorned and rearranged in 1867, under the direction of Sir Arthur Blomfield; a few years later, Messrs. Gray & Davison fitted an entirely new interior to the organ, by Harris, 1627; the case is said (as also the pulpit sounding-board) to be by Gibbons. Tillotson, Archbishop of Canterbury, was married and buried here; he had been Tuesday Lecturer when Wilkins, Bishop of Chester, the mathematician, was rector. There are several windows by Cox, Clayton & Bell, and Heaton and Butler; Thornhill painted the vestry ceiling.

* St. Mary-le-Bow, Cheapside, cost 8,072*l.*, the steeple a further sum of 7,388*l.*

BY a Bill to be promoted next Session, the Manchester, Sheffield, and Lincolnshire Railway propose to acquire a plot of ground, about four acres, on the south side of St. John's Wood-road. It is the site of the Red Hand Farm, or Barn, which is marked by name on Cross's map of 1836, by which time, however, the avenue of trees, known as the Grove, leading from Lisson Green to the Barn, had been cut down. Seventy years ago Edwin Landseer lived with his father at No. 83, Queen Anne-street East, since Foley-street, a street in which Richard Cumberland, Malone, and Fuseli had resided. At that time Landseer tenanted a studio in Southampton, formerly Upper Conway, street, Fitzroy-square. He then took a small house, being part of the Red Hand Farm, and there he ultimately settled, converting the premises for his own requirements, and passed the latter forty-five years of his life. The present house, No. 18, of two stories, and built in the Italian style, of brick, stuccoed, has grounds covering two acres, and stands next west of the Female Orphans' Home, Grove-road.

IT is announced that the house which was Handel's birthplace is offered for sale. The house—wherein Handel's spinet, a clavichord, was discovered—is now No. 6, in the Nicolai-strasse, on the large Schlamm, at Halle-on-Saale, and stands in the midst of extensive grounds. The buildings are stated to be in good condition, having been repaired and decorated, with due regard for the older portions, at the two-hundredth anniversary jubilee of the composer. We understand that the Incorporated Society of Musicians, whose annual congress will shortly be held, have undertaken to place tablets upon houses in London wherein certain eminent composers died.

THE latest addition to the numerous playhouses of Vienna is the new Raimund Theatre, which has been erected in the Mariahilf district, and is intended for the representation of Classical drama at popular prices. Its auditorium, which measures 22 mètres by 20 mètres, or 72 ft. by 65 ft., holds an audience of about 1,800, half of which number have seats on the floor of the house. The cost of the building, for which Herr F. Roth acted as architect, was 450,000 florins, or 37,500*l.* Only nine months were required for its erection. Referring to the financial aspect of this "people's theatre," our contemporary the *Deutsche Bauzeitung* publishes some interesting data on the cost per seat of the largest theatres of the Continent. A seat in the Paris Opera House cost 16,466 francs, or 658*l.*; in the Vienna Opera House, 2,000 florins, or 166*l.*; in the Budapest Opera House, 2,525 florins, or 210*l.*; and in the Frankfort Opera House, 2,356 marks, or 117*l.* The seats at the Schwerin Theatre cost 125*l.* each; at the Bruenn Theatre, 35*l.*; at Rouen the figure was 40*l.*; and in Halle and Berlin 49*l.* and 60*l.* respectively. At the Worms People's Theatre the cost was,

however, reduced to 25*l.* 15s. per seat, and at the new Raimund Theatre to about 21*l.* 5s. English figures are, unfortunately, difficult to obtain.

WE have received a copy of a report to the Vestry of Chelsea by their Surveyor, Mr. Higgens, in regard to the neglect of the London County Council to put up ventilating shafts in connexion with the low-leval sewer at Chelsea. It appears that the Clerk to the County Council, in a letter to the Vestry dated November 23, rather rashly committed himself to the opinion that "a little persuasion is all that is occasionally required to have pipes erected, at the Council's expense, against the fronts or sides of adjacent houses," for ventilating sewers. Ever since the Council have been in office the Vestry have urged on them the ventilation of the sewer in question, and called their attention to the "poisonous smells" arising from the Council's main sewer ventilators at the western end of Cheyne-walk; and in September, 1890, Mr. Higgens wrote to the Council to say that he had obtained four consents for fixing ventilating shafts, and that there were two other possible positions on sites belonging to the Council, so that six ventilators were thus provided for. In November of the same year the attention of the Council was called to the matter again, and they were asked when the shafts would be proceeded with. In reply, the Council informed the Vestry that they had instructed their Engineer to try three shafts, not at the places where consents had been obtained, but along the footway of the Embankment and Cheyne-walk. These shafts have not yet been constructed. In April, 1891, the attention of the Council was again called to complaints of smells from the Embankment and Cheyne-walk sewers, and in May, 1891, the Council replied that its efforts in the matter of sewer ventilation would be greatly assisted if vestries would arrange with persons about to construct new sewers to make provision for their ventilation by means of shafts. In December, 1891, the Vestry again intimated to the Council the necessity for ventilating the low level sewer, and suggested that, when certain land was let, the Council should make a condition that the lessees should allow ventilating shafts to be fixed alongside the new houses. They consented to this, and, in February, 1892, when the land was advertised for sale, one of the conditions provided for a ventilating shaft, which was to ventilate the wrong sewer! Fortunately, the Vestry discovered this error, and communicated with the Council, and at the sale a fresh clause was inserted, containing the necessary provision for ventilating the low level sewer. Since February, 1892, no further action has been taken by the Council, nor have any houses been erected on the Beaufort-street site in question. It appears further that all the consents for ventilating-shafts which have been obtained, have been obtained by the Vestry and not by the County Council, in spite of their belief in their powers of "persuasion," and they are accused of having ignored the consents obtained by the Vestry, and that even when the owner of new premises has gone to the trouble of erecting a shaft they have been unable to utilise it, though they have subsequently put on record their opinion that "only a little persuasion is needed," &c. These bitter words have been forwarded to the County Council, who seem at all events to need a good deal of "persuasion" themselves before they can be induced to take action.

THE ELECTRIC LIGHT AT CHATSWORTH.—The electric light has just been supplied to Chatsworth House, the Duke of Devonshire's Derbyshire residence. The work has been designed and carried out by Mr. Bernard Drake, of the firm of Drake & Gorham, 66, Victoria-street, Westminster.

ERRATUM.—In the note on the shrine of Asclepios, page 446 *ante*, the words "17 in. length," &c., should have been "17 mètres."

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE third ordinary general meeting of this Institute for the present session was held on Monday evening last, Mr. J. Macvicar Anderson, President, in the chair.

The minutes of the previous meeting having been confirmed,

The President announced that 70 persons, of whom 22 were relegated from previous occasions, had applied for admission to the Examination qualifying for candidature as Associate, and that 59 had been admitted. Two of these did not attend, 51 were examined in London, and 27 passed; 6 were examined in Manchester, and 4 passed. Of the 24 in London who were unsuccessful 6 were relegated in all subjects of the examination, and 18 in certain subjects; of the remaining 2 in Manchester, 1 was relegated in all subjects, the other in certain subjects. The names of the 31 successful candidates were as follows:—William Henry Ashford, Rhayader; Roger Francis Bacon, Reading; William Tillott Barlow, 23, Finsbury-circus, E.C.; Harry Barnes, Sunderland; Ernest Robert Barrow, 76, Mount-street, W.; Alfred Kirk Brown, Preston, Hull; William John Childs, Putney Bridge-road, S.W.; Henry Dearden, Batley, Yorkshire; John Robert Earnshaw, Manchester; Ernest Edward Fetch, East Dulwich, S.E.; Arthur James Forge, Woodford, Essex; Francis Peter Halsall, Southport; Charles Spencer Haywood, Accrington; Harry Evan Jones, Dalston, N.E.; Charles Kempson, Leicester; Franklin Kaye Kendall, Blackheath; Harold Clapham Lander, Tunbridge Wells; William Arthur Lewis, Walthamstow; Frank Lishman, Clapham Common, S.W.; John Renison Little, Bolton; John Archibald Lucas, Exeter; Arthur Hill Morgan, Chester; John Ernest Mowlem, 13, Osnaburgh Street, N.W.; John Newnham, 61, Palace Gardens-terrace, W.; George Ernest Nield, Tottenham; Douglas George Salier, 11, Spring-gardens, S.W.; Arthur William Sheppard, Tulse Hill, S.W.; David Forbes Smith, Kirkcaldy; Alfred Wright Toynton, 23, Duke-street Chambers, Bloomsbury, W.C.; George Harry Male Trew, Lavender-Hill, S.W.; Edward Box Wetenhall, Finsbury Park, N.

The President also announced that the Council had, on the recommendation of the Board of Examiners, awarded the Ashpitel prize for the present year (which, as they were aware, was given to the candidate who most highly distinguished himself in the examinations throughout the year) to Mr. Ernest Robert Barrow, and they had awarded an additional prize of books, of the value of five guineas, to Mr. Ernest Edward Fetch and to Mr. John Alexander Russell Inglis.

The President also said that he regretted to intimate that Mr. William Simpson was unable to be present to read his paper. Mr. White, the Secretary, had, however, consented to read the paper, the subject of which was "The Classical Influence on the Architecture of the Indus Region and Afghanistan"

The Secretary, at the outset, explained that the paper had been written by Mr. Simpson some months ago, and was due to a piece of work which he possessed in his own house on his mantelpiece (a photograph of which was handed to the members for inspection). This was a piece of Indian sculpture, showing portions of temples, &c., containing details which must have been derived from a classic source. It was natural to suppose that the Greeks who followed Alexander, had been the means of introducing Greek detail into India; that Greek architects had come to Bactria, during the time when the Satraps, after Alexander, ruled at Balkh. It was suggested that these architects practised in that region, until the Greek style had been more or less established; that it afterwards crossed the Hindoo Kush and attained more or less to the Indus, becoming in the process mixed with native features of construction, and thus producing that peculiar jumble of forms with which we were now familiar. As almost all the remains in which this Greek influence had been discovered were Buddhist, Dr. Leitner called it Græco-Buddhist; Sir Alexander Cunningham at first called it Aryan*; at a later date he called it Indo-Grecian. Fergusson suggested that it might be classed as Indo-Roman, or even Indo-Byzantine. The term classical had been employed in this paper to avoid any assumption as to the source of the influence. Mr. Simpson then gave a slight sketch of the history of the discovery of this classical influence in India. The first hint of it he had met with was given by Mountstuart Elphinstone in 1809. Among the first to realise distinctly, however, the classic character of much of the work in the Indus region was Sir Alexander Cunningham, who, in 1888, published a work on ancient remains in Kashmir, where classic influence could also be traced; but the extent of this classic influence was not realised till the exploration of the Peshawar Valley. On his (Mr. Simpson's) first visit to India the conclusion was forced upon him that such an influences could be traced on the details of the monuments. He had still a sketch made at that time of a capital, which seemed to him conclusive on the point. Visiting Kashmir in the following year he also noticed the classic character of the details, which confirmed his previous convictions. It was about 1870 that Dr. Leitner made excavations in the Peshawar Valley which resulted in the discovery of a considerable number of sculptures. It was to these, which were exhibited for some time at South Kensington, that Dr. Leitner gave the name of Græco-Buddhist. As to the geographical distribution of these semi-classical monuments, there were but a few in the Punjaub, between the rivers Indus and Jhelum. The temples in Kashmir were almost all Brahminical, but in those he had seen the classic influence could be traced on many of the details. The locality which had produced most of the sculpture was the Peshawar Valley. The influence was also to be traced in Buddhist remains in Afghanistan, but there were considerable dlstricts in which no remains had been reported, probably because they had not been looked for. Their first knowledge of the remains in Afghanistan was due to Mr. Masson, but his acquaintance with architecture was not sufficient to enable him to observe the classical influence, and his drawings were so small that the peculiarities of detail could not be distinguished in them. In 1878 he (Mr. Simpson) made sketches of the remains of Buddhist architecture and of its details in such a manner as to convey its character, and these left no doubt about the existence of the classical influence upon them. He could not speak of the Kabul Valley from his own observations, but there were drawings by Mr. Masson, and from these he presumed that the style in both cases was the same. In Kashmir and the Salt Range there were still remaining a few temples with columns which had been described as Doric; but if the Corinthian and Ionic forms had not been recognised in this region he doubted if anyone would have given the title Doric to these. The absence of the frieze and architrave peculiar to the Doric order might be accounted for by the fragmentary manner in which the originals were copied. Alexander's stay in the Punjab was too short to leave any permanent impression. The date of Alexander's invasion was also, he thought, too early, it being generally accepted that the remains they were considering belonged principally to the first centuries of the Christian era. The theory held up to the present had been that this classic influence originated from Bactria, where a Greek Government was established, with Balkh as its capital. A large and important city, which was the seat of government, would no doubt attract artists who would remain permanently. They had evidence that Greek artists—or at least artists familiar with Greek art—did exist in Bactria: the coins of the early rulers afforded evidence of this. There might also have been others who were architects and builders as well as sculptors. This Bactrian dynasty appeared to have lasted a century and a-half when it was swept out of existence, but 150 years would be quite sufficient time for the introduction of new forms in architecture and sculpture. Being once established the supposition was that the style in course of time found its way to Afghanistan, and passed on to the Indus. At the first view of the subject the Greek origin of the details was assumed, but later on doubts arose, and for some time past the question had been—Is the influence Greek or Roman? When he had written before upon this subjecct he accepted, after consideration, the theory that it was Greek, and used that word along with the word "classical." In the present paper he had adopted the term "classical," but the aim of the paper would be to show that the influence was Roman and not Greek. He would add some slight evidence which would go to show that this former conclusion, which had been generally accepted, and which even Ferguson supported, was very doubtful. This might be seen in details which pointed to Palmyra as the source from which the classical influence came to the north of India, and that when it reached the

* Not "Arian," as spelt in the Institute Transactions! The Arians were a sect of heretics in the fourth century, A.D.

Indus it went from that region into Afghanistan, and probably it never crossed the Koh-i-baba range into the Valley of the Oxus. Perhaps he could not do better than relate the circumstances which had led him to this conclusion. In the winter of 1884-85, when he accompanied the Afghan Boundary Commission, he kept a very watchful eye upon the architectural monuments. The fluted column, the sculptured frieze, or the Corinthian column, would have been welcome to his sketch-book. But he only saw mounds of various sizes where cities had been at different times. They seemed to contain nothing but fragments of pottery, and at times large square bricks could be seen scattered about. His own impression was that these mounds were the remains of towns constructed like those seen in the present day, which were nearly all built of mud or sun-dried bricks. Not the slightest trace of anything classical was visible. Some caves were discovered, but they were also free from the touch of anything that had Greek or Roman origin. When he returned home, Major Talbot, of the Royal Engineers, was sent on an expedition to survey eastward through the Koh-i-baba range. He sent him a number of drawings and descriptions of these caves, as well as of others at Haibak. In the expedition there was a young Brahman. He made a sketch of the great statue at Bamian. This sketch was sent home to him, and he was astonished to find that there was no appearance of Greek or classical influence upon it. If Balkh was the centre from which the classical influence started and found its way to the Indus region, then Bamian was just the spot where it might be expected to be found; on the contrary, the statues seemed to be entirely free from that influence. The details of these caves had been accepted as Sassanian, with nothing either Greek or Roman in them. On his mantelpiece he had a very fine piece of sculpture found at Hada, near Jellalabad, which contained some of the main features of classical architecture. It would be seen from the photograph that there were pilasters with quasi-Corinthian capitals, and it might also be noticed that on each of these pilasters a panel was represented. This panel was the first point he took up when asking, were there panels in Greek pilasters? He could find none. He consulted Professor Hayter Lewis on the subject, and he confirmed his conclusion. Another point was the absence of fluted columns, and a third, that there were no modillions in the Greek Ionic, and Corinthian orders. It had already been shown that there was a strong probability that the classical influence did not come by way of Bactria. They must, therefore, look for a trade route. There was the Egyptian route by which 120 ships sailed down the Red Sea every year in connexion with the commerce of Rome; but these vessels seemed to have gone to the coast of Ceylon, so that that route would not supply what was wanted. The presumption would naturally be in favour of the other route, by the Persian Gulf, but they required a much later date than the time when the Phœnicians traded in the Persian Gulf. Possibly it might have been the descendants of those people who developed the trade of India through Palmyra. Here they had a trade route at a date near enough for their purpose. The trade lasted up to the year 272 A.D. There they knew there were examples of Roman architecture, and these examples were, he thought, the nearest in point of situation to India of any that they knew of. In the Roman architecture of Palmyra they found almost all the architectural features of the sculptures in the Indus region and Afghanistan. The Corinthian order predominated. Beyond the reference already made to the absence of the classical influence in the great statues of Bamian he did not propose to touch upon the figure subjects of the sculptures, nor the coins, although he recognized their great importance. One obvious reason for silence on his part was that his want of knowledge did not entitle him to speak on this branch of the subject.

The Secretary then read two communications received from Dr. Burgess, formerly the Director-General of the Archæological Survey of India, and Professor T. Hayter Lewis. Dr. Burgess, writing from Edinburgh, stated that Mr. Simpson's paper was an eminently clear statement of the question of classical influence on the architecture of the North-West of India and Afghanistan—a question on which the last word had perhaps not been spoken. Whether the influence traceable in the remains was to be called Roman or Greek was a matter of subordinate importance, dependent chiefly on the source to which we directly traced the influence and the period at which it was felt. Roman was here only a later form of Greek art. In the first formation of hypotheses, we were apt to assume more than was necessary. The theory that if Greek die-sinkers found their way to Bactria there might also have been others who were architects or builders, as well as sculptors, was uncalled for. In those early times the artist was sculptor, architect and engraver in one. Nor need they suppose that because no remains had yet been reported from beyond Bamian of a similar type to those of Gandhara, that none existed. Remains of the sort were usually found in certain limited areas. Nor should they make out the hypothesis that Balkh was only the capital or mint city of most of the princes. Under these princes there seemed no sufficient argument for concluding that their artists did not influence the art of the region over which they ruled. Whether that influence had been fully developed long before the execution of the special group of monuments under construction, or whether it took hold of the art just about the time of their construction, might not be clear yet. From what Mr. Simpson said it was evident that no conscious effort was made to mould the forms under classical influence.

The President, previous to inviting discussion, read part of a letter received from Mr. Simpson, in which he said his first connexion with this peculiar architecture dated as far back as 1860. Since then he had seen and sketched monuments in which the influence existed in Kashmir and Afghanistan. The paper, he believed, was about the first in which there was an attempt made to analyse the details of this architecture, and he had all but avoided the sculpture with the view to determine whether it came from a Greek or a Roman source. The style itself was such a peculiar mixture of forms, the Classical details were so debased and so arranged in their parts, that to call it either Greek or Roman architecture might seem a doubtful use of words. This he was perfectly aware of, but there was no doubt of the existence of the influence through some source, and it was that source that had to be determined.

Mr. Purdon Clarke said that, having in 1870 and 1871 been stationed in Rome engaged upon the superintendence of the reproduction of Early Christian works of art, he formed a pretty good mental impression of the leading characteristics of Roman art, and especially of that of the later period. Ten years afterwards, when in India at the Lahore Museum, Mr. Kipling showed him a collection from Takht-i-bhai. His first impression was—and it had remained a very strong one ever since—that in some way these so-called Græco-Buddhist sculptures were connected more with Roman than with Grecian art. In reference to the statue before them he had very little doubt that it was intended for Minerva. It looked very much like a work of Roman art, and on two or three of the casts there would be found figures which were very much like Roman soldiers in the costumes of Roman soldiers of the fourth century. In Cashmere the buildings were pretty well known. Some of them, however, had escaped observation. In an island in the lake at Shinugger there were foundations of a building of very classical details, which, as far as he was aware, had never been drawn. Half-way between Palmyra and India on the old trade route, and not far from the city where Queen Esther was buried there was the remains of a Greek temple still standing—a building which had never been well explored. He did not think any of the columns carried their capitals. They had been destroyed by fire, and huts had been built all round them, but in several places they could trace them through the buildings. There was no doubt that there was a perfectly-formed temple of the first class, and its plan had been traced by M. Flandrin to be equal in size to the Temple of the Sun at Palmyra. Quantities of Greek and other coins had been found there.

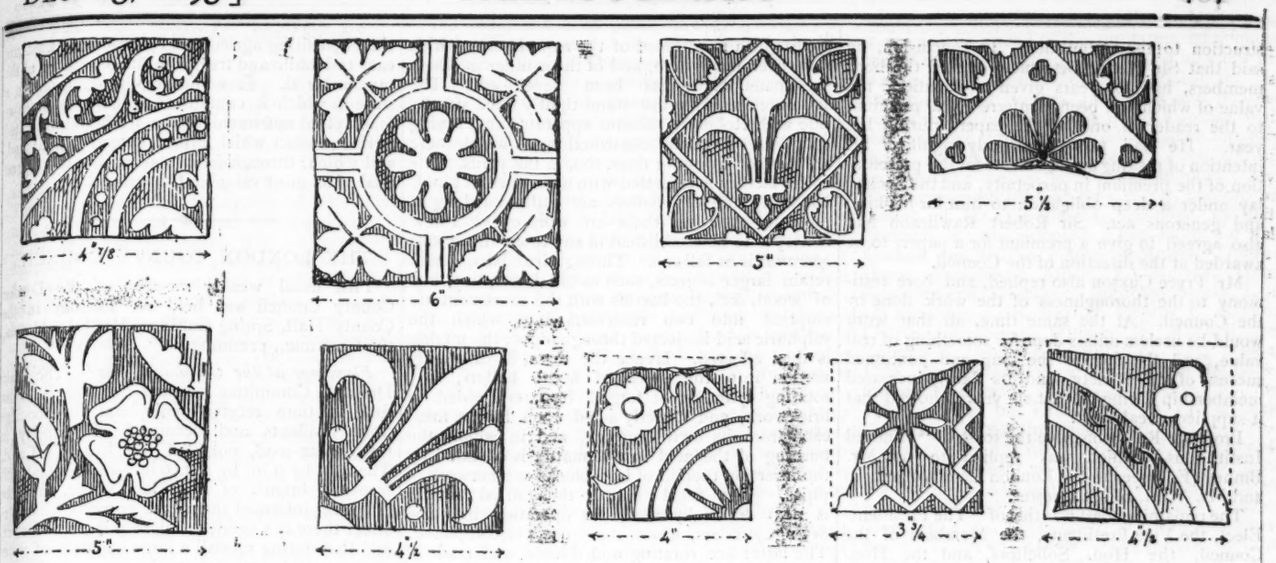
Mr. Leonard remarked that he could not say a single word which would be of use in settling the question whether Greek or Roman influence was at work among these buildings in the North of India and Kashmir. When he was at Lahore it was looked upon as quite an established thing that it was Greek influence. The ordinary class of people looked upon the sculptures and the remains in the Lahore Museum as having been influenced by Greek art, and in Kashmir the same theory prevailed, although he thought the Kashmir buildings were much more Roman than Greek in style. He did not think that Mr. Simpson had quite established his point that it was Roman and not Greek influence that had been at work. It was very likely that Greek influence was the prevailing influence at work there.

Mr. Tavenor Perry asked if he might enlarge on the theory suggested by Mr. Simpson, the farther east they went the richer they found the so-called Corinthian style. The farthest east they went was, he thought, Palmyra, and there they came into the great break of Persia, due, no doubt, to the revolution in Persia which stamped out the Greek influence at a later period. But they found in Palmyra and westwards again the richest examples of Corinthian architecture on the face of the globe. Was it not possible that this was the result of Eastern influence upon Western art rather than Western influence upon Eastern art?

Mr. Loftus Brock, referring to the collection of examples at the Oriental Institute, said they appeared to have more of Greek influence than that of Roman, but there were some examples which, like the one Mr. Simpson called his mantel-piece portion of sculpture, certainly represented a great deal of Palmyrian influence, but his impression was that the buildings of Palmyra did not all date from the time of Hadrian. The bulk, he took it, were much later; but, be this as it may, he thought their best course in a study so interesting as this would be to collect examples before they dogmatised. It was far more easy to say that there was influence from Europe in these countries in the East than it was to determine whether that influence was Greek or Roman; and the subject being so much in its infancy he thought they had hardly enough data to enable them to determine. The examples at Woking were not only architectural features, but they were examples of sculpture, and certainly sculpture which appeared to be far more Greek in character than the architecture. It might be that the architectural features were more in smaller detail than in any piece of an actually completed building. From the fact that there were so many coins in India which indicated Greek influence it really seemed no more difficult to believe that Greek artists designed the coins than that Greek artists were at work among the other artists. With regard to Palmyra, he might say that the influence of Palmyra was entirely that of a trading city. It existed not only in the time of Hadrian, but for hundreds of years, it might be, before Hadrian, so that whatever influence there might have been in Roman times was but the counterpart which might have proceeded for a long period when Greek influence would be paramount.

Mr. William White, F.S.A., said he had followed with great interest the account which had been given in the paper, and it would be rather presumptuous in him to draw any conclusion as to whether it were rather a Greek than a Roman influence which had predominated. From what had been said, it seemed to him that it was very possible that there had been an early Greek influence, and a subsequent one from the Roman, met with perhaps some centuries later. He gathered that from what had been said by several of the speakers, and not from the details themselves. He wished to ask if any one could give any account of the photograph which had been handed round, because it seemed to be a conglomeration of various styles—Greek, Roman, Byzantine, and Gothic all piled together in one.

Mr. Phené Spiers said his impression was that the influence had been not only Roman, but Greek, Persian, and Sassanian, and, finally, Byzantine. He was extremely sorry that Mr. Simpson was not present; but he was well acquainted with his (the speaker's) opinions, as he had already quoted many of Mr. Fergusson's views upon the subject. He (Mr. Spiers) quite agreed with what Mr. Fergusson had said on the subject. Of course, Mr. Simpson was acquainted with the theory that the influence referred to might possibly be due to the influence of the works of the lower empire, and in that way they would settle one difficulty which seemed to be hanging over them—it might be debased Roman and debased Greek as well. Mr. Simpson, by restricting himself to Palmyra, in which he said trade existed up to 273, confined his period to the second and third centuries. From a careful examination of photographs, and research into the developments of the Sassanian and Byzantine styles of architecture, he (Mr. Spiers) had come to the conclusion that the Buddhist sculptures had infinitely more connexion with those two later styles, and that in their character they differed widely from the Roman work at Palmyra. He (Mr. Spiers) could not accept Mr. Simpson's theories as regarded the date of the Bactrian work, seeing that it possessed features which could only be ascribed to a date as late as the fifth and seventh centuries, or even



Tiles Found at Winchcombe Abbey.

later. Mr. Simpson had pointed out that the arch, as shown, need not have had a Byzantine origin, because it was like the Chaitya arch of a Buddhist cave. It was not the arch alone, however, which decided the question; it was the close assemblage of arches, and their support on Corinthian pilasters with wide-spreading capitals, which denoted, he ventured to think, their Byzantine origin. Arches carried on columns were not found in Palmyra, in the buildings in which Mr. Simpson took for his models, but they were adopted as the principal characteristics of the style in Byzantine buildings in the East and in Eastern Europe. The capitals of the pilasters were of two designs, which might be either Persian or Byzantine. Pointing to a photograph of two niches, he said they were of that symmetrical form which they found in the Sassanian buildings, but the whole photograph was a jumble of various forms. There were, however, two decorative details on which he mainly relied to show the later date of the work. One was Sassanian and the other Byzantine. The Sassanian detail was the moulding that ran round every one of these arches; and the second, the Byzantine, was the string course, which was a leaf decoration of the ogee moulding. He thought the subject was an extremely interesting one, and he ventured to suggest that Mr. Simpson should give his reply, which might be published along with any of the photographs. In conclusion he begged to propose a hearty vote of thanks to Mr. Simpson for the trouble he had taken in preparing the paper.

Mr. W. Emerson, in seconding the vote of thanks, said he would like to say that Mr. Kipling, who was there from Lahore but was unable to speak on account of his health, would be very pleased to give the members some remarks in their journal next month. Mr. Simpson, in his paper, seemed to endeavour to prove that the Greek influence from Bactria could not have penetrated into the Punjaub and Central India, and therefore used that as a peg to hang his argument upon that Greek influence could have nothing to do with it. But Alexander, it was well known, crossed the Indus himself at a place called Attock, and not very far from that region, he believed, some time ago some engineers, in making a railway, discovered an ancient Greek burial-place. A report of this was given to the Director-General of the Archæological Survey in India, and it was expected to appear in one of their books. This seemed to show that Greek influence was in the neighbourhood, at any rate. While he was at Lahore Museum he saw some of the sculptures. There was a large representation of Buddha, which gave him a very strong impression of Greek influence, certainly more Greek than Roman; and he thought the sculptures, in some cases, did show more Greek than Roman influence with regard to the folds in the drapery. They had taken a great deal of trouble to prove how far this influence of Greece and Rome had affected the art and architecture in that part of India, but everything in the West had proceeded from the East. The East was the cradle of the religions and beliefs and the arts and architectures; in fact, it was also the cradle of the human race according to Scriptures. Was it not likely that some of these types of arts which they were trying to prove wholly originated from Greece—that the germ of them had been originated in these localities and started westward, and were there perfected by the Greeks and Romans, and perhaps came back again? He did not think they could find a specimen of ancient Indian architecture in which there were not numberless little details which were very closely similar to some details in Roman and Greek work. Might it not be, therefore, that the origination of these types really came from the East? With regard to the point mentioned that certain of these sculptures looked very like early Christian work, the Nestorians penetrated into both India and China. In China at the present moment there were remains of certain buildings which were known to be Nestorian. Was it not possible that they might have taken some suggestions of art into India at that time?

The President said that Mr. Simpson had supplied a very able and exhaustive paper—a paper displaying great research, and to which he had evidently devoted a great deal of time and thought—in order to demonstrate that the influence to be traced in the art of Central India was derived from Roman influence and not from Greek influence. Others were directly of an opposite opinion. He confessed that the impression left upon his mind was this—that it was unnecessary to attempt to prove that the influence was derived either from Greece or Rome. What Mr. Emerson had said appealed to his sympathies. He could not for the life of him see why they should not give some credit to the earlier Indian artists for some amount of originality.

The vote of thanks was then put to the meeting and agreed to unanimously.

The proceedings then terminated.

TILES FOUND AT WINCHCOMBE ABBEY.

THESE are drawings of the designs on a few tiles which were come upon in the course of the recent excavations on the site of Winchcombe Abbey, described in our issue of October 28.

THE ARCHITECTURAL ASSOCIATION.

ON the 15th inst. a special general meeting of members of this Association was held to consider the question of the admission of ladies as members of the Architectural Association.

The President, Mr. E. W. Mountford, occupied the chair, and the following resolution was proposed:—"That in the opinion of this meeting ladies engaged in the study or practice of architecture are eligible for election on the same terms and under the same conditions as gentlemen."

Mr. H. O. Cresswell in opening the debate, pointed out that the object of the meeting was to bring the question before the general body, and give them an opportunity of discussing it.

In the discussion which followed, the following gentlemen supported the resolution:—Messrs. F. R. Farrow, B. F. Fletcher, and E. Woodthorpe.

The following gentlemen spoke against the resolution:—Messrs. Cole A. Adams, W. H. Atkin Berry, H. N. Kerr, H. Lambert, S. Perks, and others.

The resolution was put by the President, when thirty-seven members voted in favour of the resolution, and seventy-eight against, several members not voting. The meeting then terminated.

THE SOCIETY OF ENGINEERS:

ANNUAL DINNER.

THE Annual Dinner was given at the Holborn Restaurant on the 13th inst. The President, Mr. W. A. McIntosh Valon, J.P., occupied the chair, and amongst a large company present were Sir Robert Rawlinson, K.C.B. (Vice-President, Institution of Civil Engineers); Mr. W. H. White, C.B., F.R.S. (Director of Naval Construction to the Admiralty); Mr. W. Worby Beaumont, Mr. E. K. Blyth, Mr. H. J. Chaney, Mr. Geoffrey Drage, Mr. F. Fanta, Mr. R. C. Glen, Mr. W. A. Hubbard, Mr. Walter King, Mr. E. Lloyd Pease, Mr. J. Rexworthy, Dr. L. T. Thorne, Mr. W. H. Webber, Mr. H. O'Connor, Mr. W. Spon, Mr. G. A. Goodwin (President-elect), Mr. Henry Faija and Mr. W. G. Peirce (Vice-Presidents); Mr. J. Bernays, Mr. Chas. Gandon, Mr. Perry F. Nursey, Professor Henry Robinson, Mr. A. T. Walmisley and Mr. J. W. Wilson, jun. (Past Presidents); Mr. S. H. Cox and Mr. G. M. Lawford (Members of Council); Mr. Alfred Williams (Hon. Secretary and Treasurer), Mr. Samuel Wood (Hon. Auditor), and Mr. G. A. Pryce Cuxson (Secretary).

The President gave the usual loyal and patriotic toasts.

Mr. W. H. White, C.B., F.R.S., in responding for the Navy, said that the shipbuilding and engineering resources of this country were matchless.

Sir Robert Rawlinson proposed the toast of the evening—"The Society of Engineers, the President, the Hon. Secretary and Treasurer, and the Secretary." In his boyhood, he said, such engineering as now existed was in its infancy. Railways had scarcely been commenced, gas-lighting, except in one or two places, was an unknown matter, and mercantile shipbuilding was on a very small scale. The changed circumstances had now opened up enormous fields to the younger members of the profession.

The President, in reply, said that during his year of office every member of the Council had endeavoured to promote the success of the Society by self-sacrifice and attention to their duties, and they were greatly indebted to their Hon. Secretary, Mr. Alfred Williams, as well as the active assistance of their excellent secretary, Mr. Pryce Cuxson. He further said that the prosperity of the Society had been assured for years past; in their lifetime of forty years, like other institutions or persons, they had their times of depression and anxiety, but today they stood in a more prosperous position financially and numerically than at any previous time in their history. He also remarked on the opportunities given to the younger engineers to visit works and learn from the great teacher "Observation." They were reminded in Lord Kelvin's recent Presidential address to the Royal Society, that the received facts of to-day are often the fictions of to-morrow, which proved the necessity for constant discussion of accepted theories as well as the strict examination of new ones. The President then referred to the hon. members, of whom they had lost during the year, Dr. Frantz Grashof, Director des Vereins Deutscher Ingénieure, the Council having filled the vacant place by the election of Mr. W. H. White, C.B., F.R.S., Director of Naval Con-

struction to the Admiralty. In conclusion, he said that Sir Henry Bessemer, one of the hon. members, had for years given a donation, the value of which had been conferred as a premium to the reader of one of the papers during the year. He had now generously signified his intention of making arrangements for the presentation of the premium in perpetuity, and the Society lay under a deep obligation to him for his kind and generous act. Sir Robert Rawlinson had also agreed to give a premium for a paper, to be awarded at the direction of the Council.

Mr. Pryce Cuxson also replied, and bore testimony to the thoroughness of the work done by the Council. At the same time, all that work would be useless unless done for something of real value, and the fact of the long and continued success of the Society, and its largly-increased membership during the last six years, showed that it supplied a real want.

Professor Robinson gave the toast of "Kindred Institutions," which was replied to by Mr. Binney (Engineer to the London County Council) and Mr. West, of Manchester.

The remaining toast was that of "The President-Elect, the Vice-Presidents, the Members of the Council, the Hon. Solicitors, and the Hon. Auditors."

BUILDERS' BENEVOLENT INSTITUTION:

ELECTION OF PENSIONERS.

AN election of two pensioners on the funds of this Institution took place on the 14th inst., at the offices, 35, Southampton-row, Bloomsbury-square, W.C., Mr. George Haward Trollope (President) in the chair. There were two vacancies, for one man and one woman. At the conclusion of the poll, the scrutineers, Messrs. T. Stirling and E. S. Rider, declared the result to be as follows:—Alfred Clement, 115, Bedford-road, Brixton, builder, aged 73 (second application), 1,999 votes; Jack Taylor, 14, St. James's-road, Bermondsey, aged 62, master slater (second application), 1,348 votes; Sarah Elizabeth Drake, Tylers' and Bricklayers' Almshouses, Balls Pond, aged 63, widow of Francis Drake, builder (sixth application), 3,035 votes; Susannah Mansell, 20, Bridge-road, Hammersmith, aged 70, widow of William Mansell, builder (fifth application), 4,119 votes; Mary Ann Healing, 20, Curtain-road, Shoreditch, aged 63, widow of Samuel Thomas Healing, builder (fourth application), 312 votes; and Maria Elizabeth Powell, 281, Albany-road, Camberwell, widow of George Thew Powell, late a pensioner of the Institution, and who subscribed to the charity for some years (first application), 700 votes. The successful candidates, therefore, are Alfred Clement and Susannah Mansell.

Votes of thanks were passed to the President, the scrutineers, and the check-takers, and the proceedings terminated.

THE PODEWIL SYSTEM OF TREATING FÆCAL MATTER.

THE Danish technical journal, the *Ingeniör*, the organ of the Copenhagen Society of Engineers, gave recently an article on the Podewil system of treating fæcal matter, of which the following is a translation.

"Proposals having been made to arrange for the treatment of the fæcal product in Copenhagen according to Von Podewil's system, it may be of interest briefly to describe the same, the more so as most of what has previously appeared on this subject—even as late as 1889, in Muspratt's "Technische Chemie"—is very inaccurate. But, on the other hand, it should be added that the system, or, more particularly, its details, has been steadily improved of late years; in fact the details have only been exactly settled since then. The principle of this system is that the fæcal matter is mixed with sulphuric acid, whereby a powder-like poudrette is obtained, in which all the valuable original substances are retained in a form easy of absorption by plants. The evaporisation with sulphuric acid itself is not peculiar to this system alone, as similar processes are adopted with the Liernur system and at the former Hanover Poudrette Factory; but what is new with the Podewil system is that the process is much more simple, and the heat utilised so well that the production is a financial success, *i.e.*, when the fæcal matter is obtained gratis. If the Von Podewils'sche Fæcal-Extract Fabrik, situated on the outskirts of Augsburg, be visited, a clear idea is obtained of the experiments which have been made here, and of the manner in which the manufacture has been developed. The apparatus now in use stand tightly fixed side by side with Roberts's vacuum apparatus and drying cylinders of various construction, of which there are a lot of worn-out ones, too, in the yards. The entire factory is encircled with a network of pipes. Naturally, the old boilers are utilised as long as possible, but when these are worn out or a new factory is to be established in any town the *modus operandi* is as follows. Through iron bars, which retain larger objects, such as old boots, tins, bits of wood, &c., the barrels with the excrement are emptied into two reservoirs into which the sulphuric acid is ejected through pipes; the mixing is then effected. Hence the mass is drawn by suction into the so-called fæcal boilers, *i.e.*, rotating cylinders of forged iron, embedded in brickwork, and directly acted upon by the fires, each from its own fireplace, and in which the burning of the acid latrine matter is obviated by the insertion therein of iron blocks or a network of pipes. The fæcal matter thus dried so far is next drawn by a similar operation into the drying cylinders, where the process is completed. The latter are rotating and double, and made of cast-iron, into the outer chamber of which the waste steam from the engine and the acid vapours from the fæcal boilers are conducted, whilst in the inner chamber the vapours developed from the fæcal product are drawn off and condensed by an injecting condensor, so that the evaporation here takes place in a vacuum. In these cylinders, too, lumping and adhesion of the mass to their sides have been obviated by the introduction of loose, heavy, iron chains. The final pulverisation and mixing of the product is effected by a disintegrator. It should be pointed out that even in close vicinity of the factory no bad smells are noticeable—not nearly so bad as, for instance, near a chicory factory or a maltery. The condensation water runs clear into a little stream, and is perfectly clean, almost free from odours. If a Podewil factory be compared with a poudrette factory on the Liernur, Buhl, or Keller system, the great simplicity of the arrangements and method in the former are strikingly apparent, whilst it has also the advantage of the last-mentioned system that *all* the plant-feeding substances found in the raw material are equally found in the poudrette, partly in a form easier of assimilation. It may here be remarked that when it has been publicly stated that the evaporation of the latrine product with sulphuric acid causes a loss, thereby that a portion of the hydrogen in the same would be present in the form of acid of saltpetre, which would be ejected by the sulphuric acid, and thereby be lost, this theory is quite erroneous; for the raw latrine product does *not* contain acid of saltpetre; but, on the other hand, no inconsiderable quantities of ammonia, which become bound by the sulphuric acid, and just thereby preserved in the poudrette. That the evaporation with sulphuric acid causes a complete sterilisation of the fæcal matter is self-evident, and if only the removal of the barrels for holding it be effected in a careful manner, the poudrette manufacture by which the mixing of the sulphuric acid and the process of boiling are effected immediately after their emptying, affords the greatest possible guarantee in sanitary respects. The only system which might be said to offer greater protection is the water-closet system, but only when, in a city like Copenhagen, such closets were *compulsory*. Otherwise they would lose all importance. But there must, of course, in regard to the former systems, besides the important sanitary points, also be considered the economical ones, and it has been complained of the Podewil system that its introduction would be attended with increased expenditure for householders. But this objection has no foundation in fact, as when at a future time it will become necessary to demand a higher tax rate for the removal of the latrine barrels, this will be necessary in any case, whatever system be adopted; so when there shall be a reform of our "night renovation system" the municipal authorities will be obliged to demand various important improvements, such as a quicker clearing of the barrels, and most probably the adoption of closed steel barrels, and their regular and proper cleansing outside and inside, so that the rates for this work *must be raised in any case*. To conclude, the Podewil system must, all details considered, be said to be the best of its kind, *i.e.*, the fæcal system which satisfies most satisfactorily the demands of hygiene, the householders, the agriculturists, inasmuch as it ensures a complete sterilisation of the latrine matter, and only costs the householders the removal, whilst at the same time benefiting agriculture by producing a manure easy to handle and free from the objections to the raw material. In addition, it is delivered in a state in which it contains in volume six times as much plant nutriment as the fresh and untreated latrine product which farmers spread on their land, and which, through fermentation, has lost a great deal of its most valuable properties."

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, Mr. John Hutton, the Chairman, presiding.

Floodings at the Caledonian-road.—The Main Drainage Committee reported that they had from time to time received complaints of floodings from residents and occupiers of property in Caledonian-road, north of the Regent's Canal. The 4 ft. by 9 in. by 2 ft. 6 in. sewer in that road forms a branch of the Fleet sewer, and the Engineer informed them that opposite Charlotte-street there is a sudden fall of 9 ft. in the sewer, and that during rainfall a large quantity of water passes quickly into it from the sewers in the cross streets which have steep gradients, and thus cause it to fill rapidly and to flood the deep basements on the east side of Caledonian-road. He now suggested that in order to improve the sewer by giving it a more gradual fall and constructing it as low as possible in relation to the basements and various house drains, the invert should be lowered from the point near Charlotte-street as far as Richmond-road, or for a length of about 1,350 ft. The Committee had carefully considered the matter, and were of opinion that with the view to avoiding floodings in the locality the work, which is estimated to cost 3,600*l.*, should be carried out by the Council, and they recommended—

"That the Council do approve of the deepening of the Caledonian-road branch of the Fleet sewer north of the Regent's Canal as suggested by the Engineer, and that he be instructed to prepare the necessary plans, specification, &c., with the view to the work being carried out by the Works Department."

The recommendation was agreed to.

Progress of Works at the Blackwall Tunnel.—The Bridges Committee reported in regard to the works connected with the Blackwall Tunnel that with the exception of filling up the old low-level line of sewer, the sewerage works are finished, the fireproof galvanised iron fence and the approach-road at Ordnance Wharf are completed, and at Northumberland Wharf nearly all the river wall is executed. The caisson for No. 1 shaft is sunk to a depth of 10 ft. 6 in., and rivetted for an additional height of 42 ft. 6 in.; that for No. 2 shaft is lowered 16 ft. 6 in., and rivetted for a height of 36 ft.; that for No. 3 shaft is sunk to a depth of 77 ft., or within 21 ft. of its full distance, with all the rivetting done, and that for No. 4 shaft is practically finished. With regard to the cut-and-cover portion of the tunnel on the north side of the river, no steps have been taken for some time past. All the excavation on the south side of the river for the original cut-and-cover is executed, the arch has been keyed in for a length of 120 ft.; the remaining length is complete to springing, and the arch is being turned thereon for 30 ft. In that portion of the cut-and-cover, substituted for cast-iron lined tunnel, the trench is formed for the whole length, viz, 570 ft. to an average depth of 40 ft., and the concrete foundation, including a part of the sides of the same material, is built for a distance of 160 ft. The clearing out of the portion of the trench which lately collapsed is being proceeded with, and a row of piles is being driven at each side of the excavation for the reinstatement of the timbering. Of the cast-iron lining 165 rings, being a length of 412 ft. 6 in., have been erected, and only 60 more rings have to be placed in position to complete No. 3 shaft. The subway for the pipes in the original cut-and-cover on the south side of the river is finished. In the raised approach on the south side of the proposed tunnel, a length of about 1,300 ft. of 3 ft. 9 in. by 2 ft. 6 in. sewer has been formed, the connection thereof with the southern outfall sewer in Woolwich-road is commenced; a length of 543 ft. of the 18-in. pipe sewer is completed, and the 18 pipes for tidal irrigation drains have been laid; the bank for the road has been tipped for a distance of 600 yds. The estimated value of the work executed is 230,810*l.*

After transacting other business the Council adjourned until January 16.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The usual fortnightly meeting of this Association was held on the 13th inst. in the Royal Institution, Edinburgh, the President, Mr. W. W. Robertson, in the chair. Dr. Robert Munro (F.S.A., Scot.) read a paper on "The Structure and Architectural Features of Lake Dwellings." The lecturer said that the system of lake habitation, so prevalent in Central Europe during the Stone and Bronze Ages, had so completely disappeared that scarcely a trace of it survived in the traditions of the countries in which formerly lake dwelling were most abundant. The preliminary problem which lake dwellers had to solve before lacustrine habitation became possible was how to construct a level platform on which the huts could be erected. This was effected in three ways—by driving long piles into the bed of the lake, leaving their tops projecting at a uniform level above the water, and then placing over them transverse beams, so as to form a firm platform capable of supporting dwelling-huts. The habitations so constructed were called pile structures. Substituting for piles a solid sub-structure of wood or mixed materials—wood, stones, earth, &c.—was the method most commonly adopted in Scotland and Ireland, where their remains are known as crannogs; and the third method was to construct in close proximity to each other a set of rectangular basements of wood, each side being composed of horizontal beams overlapping each other at the four corners, like the logs of a Swiss chalet. As regarded the huts of the pile structures, the only reliable data consisted of clay mouldings, hearth-stones, culinary implements. But that kind of evidence gave little information in regard to the size, form, or internal structure of the huts themselves. On these points archæologists had to go to lake dwellings which had more permanent foundations than piles. Two important discoveries bearing on these points had come to light in more recent times. One was the entire foundations of a cottage, with portions of its walls still standing, exposed in the peat on the site of the well-known lake dwelling at Schussenried, in Wurtemburg. The other was the ruins of a circular wooden house in a crannog near Balinakile, Argyllshire. From the general review of the subject, Dr. Munro concluded that the flooring of the huts in the Pfahlbauten was formed of clay mixed with rushes, or sometimes with gravel, over which a few flat stones were placed as a hearth. The walls, probably of no great height, consisted of a skeleton of timbers and wicker-work, daubed over with a thick coating of puddled clay. The roofs were made in a pointed fashion, and covered with layers of straw or rushes. The crannogs supported large wooden houses, either circular or rectangular. At the close of the lecture, which was illustrated by diagrams, a hearty vote of thanks was accorded to Dr. Munro.

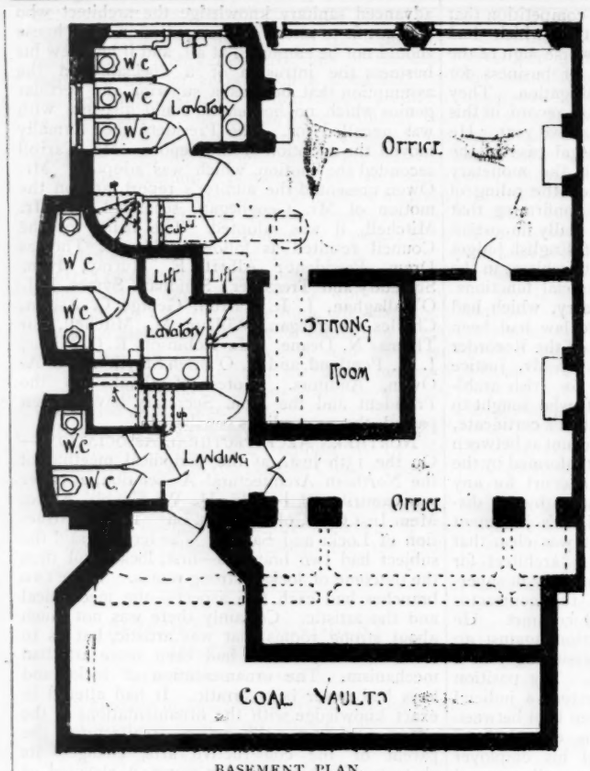
ROYAL INSTITUTE OF THE ARCHITECTS OF IRELAND.—On the 16th inst. the annual general meeting of the Royal Institute of the Architects of Ireland was held at 37, Dawson-street, Mr. Thomas Drew, R.H.A., President, in the chair. The Hon. Secretary, Mr. Murray, read the annual report of the Council, which stated that the position of the Institute in the country was steadily improving and its members increasing. It was quite evident that the coming generation of Irish architects would be left behind in the race as compared with their brethren in Great Britain if they did not avail themselves of the opportunities for study placed before them. It was a cause of much regret that some great teaching body, such as one of their Universities, did not include a course of architectural education in its curriculum.—The President said this had been a very blank year in the profession in Ireland. He had literally no incident of importance in the history of architecture in Ireland to discuss with his fellow members. They were never politicians in their Institute of Architects, but one and all of them admitted to each other that a year of political unrest was always bad for architectural progress. In this past year, while Irish politics were very much uppermost, architecture and all the arts had languished. There had been less new work started this year than he could remember in a retrospect of forty years. There was avowedly great want of employment in the building trade, and there was a pinch coming on the artisan class. They all knew of the numbers of architects' assistants who were vainly seeking employment, and of the stagnation in most of their offices during the summer. He could not even point to a competition that had stirred them, or to litigation which had enlivened them. There was no worse sign of the prosperity of the country, and of business for architects, than the absence of litigation. They had not had even an arbitration on record in this extraordinary and unexampled inactive year. He might point, however, to one legal case in the local courts, not one in which the monetary interests were large, but in which the ruling of one of the ablest of Irish judges confirming that of the Recorder of Dublin, was a really important one as following up the ruling of English judges as to the legal rights of an honest architect in the exercise of his peculiar quasi-judicial functions. In the case of Verschoyle v. Parry, which had been before the local courts, the law had been again vindicated. The judgment of the Recorder of Dublin, supported on appeal by Mr. Justice Gibson, was a valuable decision for Irish architects. In this case the plaintiff, who sought to impugn the *bona fides* of the architect's certificate, and to review the petty items of account as between him and the builder, was promptly informed by the Recorder that he did not hold a court for any such purpose. On the appeal, taken by the dissatisfied plaintiff, Mr. Justice Gibson's judgment was to the following effect:—"It was clear that an action did not lie against an architect for negligence in the discharge of his duty in supervising a work and seeing that the contractor carried out the specification and contract. He had never heard before of an action against an architect for certifying wrongly, assuming that a certificate was given in good faith. The position of the architect was to a certain extent a judicial one, and he had to steer an even keel between conflicting interests and opinions of the contractor on the one side and of his employer on the other, and if he were at all a good judge, he was certain to dissatisfy each. Of course, if he were one-sided and incapable, he would go altogether in favour of one of the litigants, but it would be a hard thing where an architect acting honestly had done his best to solve a controversy between two disputants that he should be personally liable merely because a jury or a court afterwards—or even the House of Lords on appeal—should decide that he was wrong in point of law or fact. There was no imputation against the honesty or desire to do what was right by Mr. W. Kaye Parry, and there was no wilful or gross misconduct on his part which it would be necessary to establish to make him personally liable." The action was dismissed, with costs against the plaintiff. There were few architects long in practice who had not had an occasional experience of a bullying employer who questioned his certificate and threatened pains and penalties with a view of reducing the builder's claims and discounting the architect's fees. Let no honest young architect be intimidated by such mean procedure. The law was with him, the sympathy and support of his professional brethren was at his call, and on his honest certificate the employer must certainly pay. The President, speaking in favour of stone building, said that the entire sympathy of every architect in that room was with the employment of cut stone work as the art of all others bound up with the perpetuation of noble architecture and the traditions of the past. In the progress and development of this century the scientific and industrial production of artificial building materials, and the ever-increasing cost of skilled labour, were developing building changes which architects could not influence. What architect was there who would not wish to realise noble architecture in native cut stone? Who was there who deliberately took kindly to the mechanical and frivolous material of terra-cotta? It was degrading to the architect. He did not even design it. It was found for him in the terra-cotta manufacturers' pattern-book. The building result was generally no characteristic design of his. As an alternative, real architects in Dublin were met with the very embarrassing position that the cost of cut stone work had somehow reached a figure that made it prohibitive to employ it in any but monumental building, where cost was no object. On the subject of delays in building he might allude to an evil from which their profession suffered in Ireland—the leisurely tardiness, increasing year by year, with which building operations were carried out. It was not so elsewhere. It was not so in olden times with them. He thought they had much of the remedy for this in their own hands if they were of one mind about it. On the question of the employment of sanitary specialists his view was that in these days of advanced sanitary knowledge the architect who was not fit to attend to the sanitation of a house should not be employed at all, and if he knew his business the intrusion of a specialist on the assumption that he was a superior and peculiar genius which no household could dispense with was uncalled for. The President then formally moved the adoption of the report. Mr. Carroll seconded the motion, which was adopted. Mr. Owen presented the auditor's report, and on the motion of Mr. Geoghegan, seconded by Mr. Mitchell, it was adopted. The ballot for the Council resulted as follows:—Messrs. Thomas Drew, President; Albert E. Murray, Hon. Secretary and Treasurer; Sandham Symes, J. J. O'Callaghan, J. R. Carroll, George C. Ashlin, Charles Geoghegan, William M. Mitchell, Sir Thomas N. Deane, J. L. Robinson, R. C. Millar, J. H. Pentland, and R. O'Brien Smyth and C. A. Owen, Auditors. Votes of thanks to the President and the Hon. Secretary having been passed, the proceedings concluded.

NORTHERN ARCHITECTURAL ASSOCIATION.—On the 13th inst., at the periodical meeting of the Northern Architectural Association, a paper was contributed by Mr. H. W. Chubb, Assoc. Mem. Inst. C.E., of London, on "The Construction of Locks and Safes." The lecturer said the subject had two branches—first, locks, and then the outcome of locks—strong rooms. These two branches had each two aspects—the mechanical and the artistic. Certainly there was not much about strong rooms that was artistic, but as to locks and keys there had been more art than mechanism. The ornamentation of locks and keys had never been erratic. It had altered in exact knowledge with the ornamentations of the periods of art. Whenever architecture, the parent of the constructive arts, changed its character for better or for worse, it elevated or depressed the character of its subsidiary arts, and these little metal objects took their share of the change. But, when viewed from the mechanical side, we saw no such guiding or controlling influence; indeed, but little rule at all except the operation of evolution.

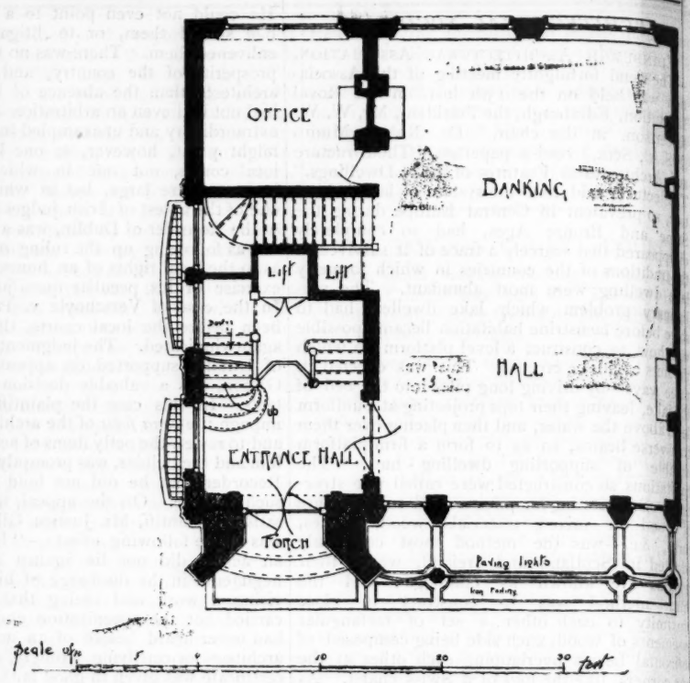
GLASGOW MASTER WRIGHTS' ASSOCIATION.—The usual quarterly meeting of the Glasgow Master Wrights' Association was held on the 14th inst. in the rooms of the Association, 64, West Regent-street — the President, Mr. William Livingstone, in the chair—when Mr. William Forrest Salmon, F.R.I.B.A., President of the Glasgow Institute of Architects, delivered an address on "The Master Wright and the Architect." Mr. Salmon spoke of the affinity of the master wright with the architect, and showed how architecture in its initial efforts was indebted largely to the carpenters of primeval times, and as master wrights had all down the centuries borne a certain share in the development and progress of the various styles, they ought to continue to devote themselves to a study of the art, and to endeavour to assist to the utmost the present eager desire for improvement in all matters connected with building. He insisted that the master wright and the architect were fellow-workers in the same cause; that where an architect is aiming at high excellence he ought to be aided in his endeavours by the various craftsmen he employs. The craftsman ought to so qualify himself that he can interpret the architect's drawings and give expression to his design.

ELECTRIC LIGHTING OF FLEETWOOD.—On the 13th inst. a report on the electric lighting question was laid before the Fleetwood Improvement Commissioners. It was the opinion of the Committee that the total capital required for a complete installation would not exceed 11,000*l.* The system recommended for adoption is the high tension alternating system, with suitable transformers. Tenders were received from the following selected firms, viz.—C. A. Parsons & Co., Newcastle; Siemens & Co., London; Greenwood & Batley, Leeds; Andrews & Preece, Bradford; and the Brush Electrical Engineering Co., London. The tenders ran between 6,500*l.* and 8,700*l.* The Committee recommended that the Brush Company's tender be accepted, but the board decided to consider the question at a special meeting.

LIFTS.—We understand that Messrs. R. Waygood & Co. are now manufacturing a "Patent Economic Lift," invented by Mr. Robert Carey, in which by means of a suitable and simple arrangement of cylinders and rams, and a very ingeniously constructed starting valve, the consumption of water is approximately proportioned to the actual load lifted in each particular trip of the lift. This arrangement adapts itself automatically to the work to be done, without any effort on the part of the attendant working the lift, and it is claimed that a saving of 50 per cent. to 60 per cent. of the water is effected by it.



BASEMENT PLAN.



GROUND PLAN.

Nos. 52 and 53, Parliament-street.

Illustrations.

VIEW IN NORTH-WEST TRANSEPT, LINCOLN CATHEDRAL.

THIS fine drawing, by Mr. J. J. Cresswell, should perhaps be more correctly entitled "View Looking from North-West Transept," across the crossing, and showing a portion of the nave on the right. It is a very good position for securing an effective interior composition, and Mr. Cresswell has done justice to it.

A historical account of Lincoln Cathedral, with plan and further illustrations, will be found in the *Builder* for November, 1891.

NOS. 52 AND 53, PARLIAMENT STREET, WESTMINSTER, S.W.

WE give the perspective view and plans of basement and ground floors of this building, which is now in course of erection. The ground floor has been arranged for banking premises, with general offices, measuring about 40 ft. by 25 ft., well lighted both in front and at back; a managers' room is in connexion therewith, and the large office in the basement is to accommodate a portion of the staff. There is a strong-room in the basement, with book and bullion lift to the ground floor, and a trolly-track and turntable leads from the strong-room to the lift.

The upper floors are arranged for separate tenancies, each floor being served by a passenger-lift. There is ample lavatory accommodation for the bank in the basement, and for the remainder of the tenants on the ground floor; housekeepers' apartments are placed on the fourth floor.

The internal fittings will be of polished walnut. The wrought-iron balustrading of the staircase, also the grilles and lift enclosures, will be supplied by Messrs. Jones & Willis.

The façades on the north, east, and west sides will be faced with an entirely new material, *i.e.*, a grey terra-cotta, having the appearance of a warm-tinted Portland stone, somewhat aged; the texture is granular; the wall surface will be treated with 9 in. by 4½ in. by 2 in. special bricks of a rich purple red colour. The whole of the terra-cotta and brickwork is being made, and will be fixed by Mr. S. H. Leech, of Harroway Works, York-road, Battersea. It will be remembered that it was Mr. Leech who read a most interesting paper upon Terra-cotta at the Institute early in this year.

The drawing of this building, of which Mr. Herbert Huntly-Gordon is the architect, was exhibited at this year's Royal Academy.

A SMOKING-ROOM IN A LONDON MANSION.

AFTER this mansion was built, but before the internal finishings were begun, the owner bought the deal skirting, door-cases, chimney-piece, and panel over another ornamental panel, with a looking-glass and the mahogany doors, from a demolished house in the City of London; the room from which these details came being higher than the new one. Some little ingenuity was wanted to fit the ornamental parts to the room already built, and to panel it becomingly, and an ornamental cornice and ceiling were wanted.

The chimney-piece was made for a higher and wider opening, and could not be cut without destroying it, so a boldly-moulded panel in Pavonazzets marble was inserted between the wooden chimney-piece and the grate.

To give a little more interest and variety to the room, which was only about 19 ft. by 17 ft., the ceiling had pendants and panels ornamented with scroll-work.

As the room in summer time was the owner's favourite sitting-room, and the light coming from a narrow courtyard was not too good, the whole interior was painted white.

Professor Aitchison, A.R.A., is the architect, and the drawing was exhibited at the Royal Academy this year.

COMPETITION DESIGN FOR GLASGOW ART GALLERIES.

THESE plans were prepared for the preliminary competition. The intention was to design a building suited to the rapidly-increasing wealth and importance of Glasgow as a great commercial centre, and to show a plan which could be erected in clearly-defined portions.

The central feature is the music hall, and its elliptical form was adopted for acoustic reasons, and because also curved lines seem the most appropriate in appearance for a concert or music-room. On either side on the ground floor are the museum galleries, and above the picture and sculpture galleries.

The three principal frontages show similar horizontal lines but varied in detail, a broad and continuous frieze binding the composition together. Externally also, the central feature is the dome of the music hall, and its construction lines have been rigidly expressed, while its copper-covered roof would have contrasted well with the red-tile roofs surrounding it, and the cream colour of the stone of the buildings. The whole design was governed by the fact that the site is dominated by Gilmore Hill, and the university with its high Gothic tower and spire.

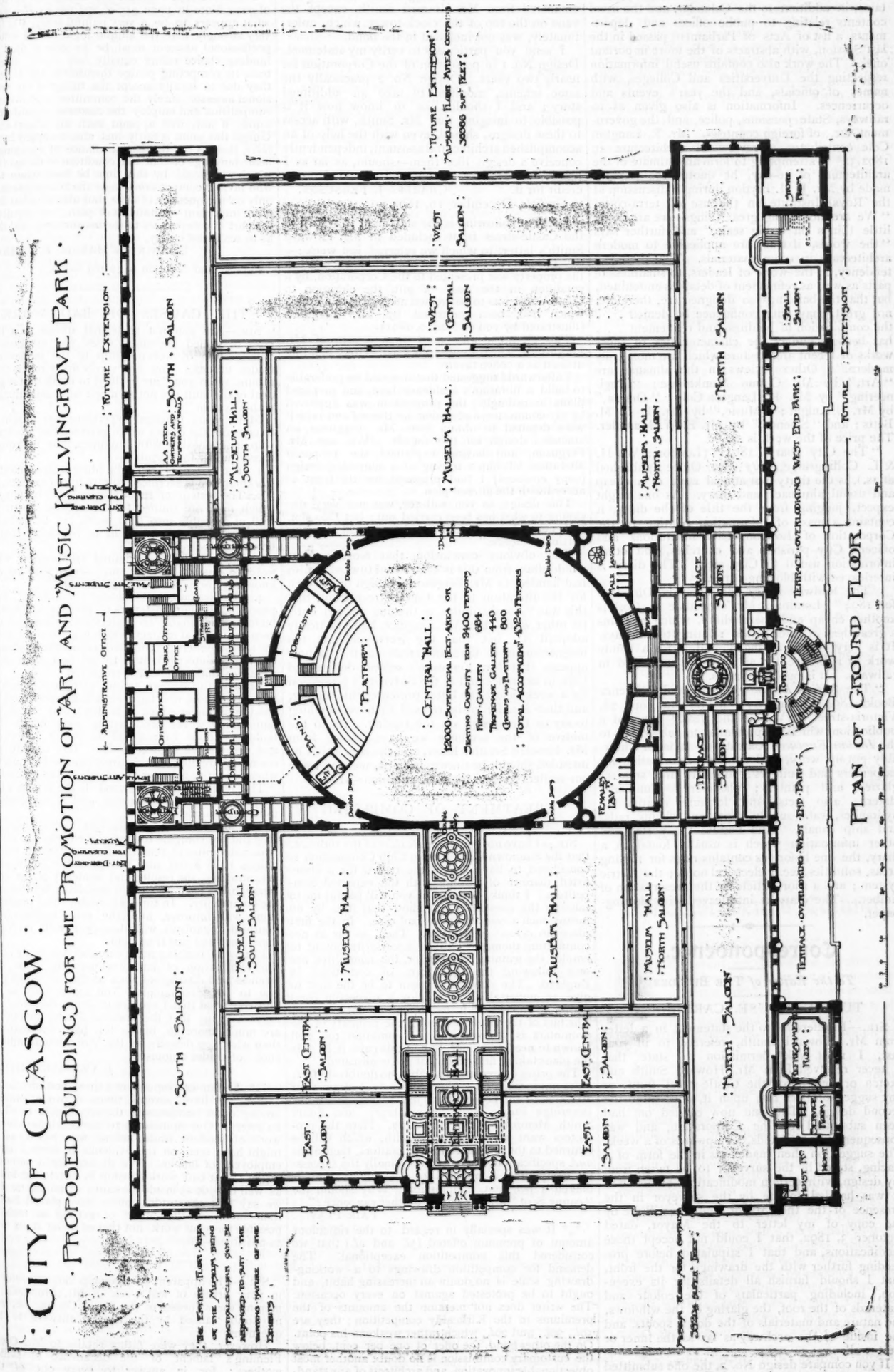
The design is by Messrs. Morris & Hunter, and the drawings of the elevations were exhibited at the Royal Academy this year.

THE POST OFFICE DIRECTORY.

"THE Post Office London Directory for 1894" (London: Kelly & Co., Ltd.), which has just been published, is the 95th issue of that useful and indispensable compilation. As in previous issues, it is corrected close up to date, and the large map which accompanies it has been mounted on linen. For so large and for such a work the Directory is singularly free from mistakes, a fact which says much for the care bestowed upon it by its editors; but we notice that the name of the hon. sec. of the Royal Institute of British Architects, Mr. William Emerson, appears in the Commercial Section with one more "m" than it is entitled to, although in other sections the name is printed correctly. We have tested the work in other respects and have found it remarkably accurate. The Directory, the price of which is 32s., has increased by twenty-five pages since last year (2,883 pages against 2,858).

ALMANACKS AND DIARIES FOR 1894.

WE have received from Messrs. Hudson & Kearns, of 83, Southwark-street, S.E., a parcel of their well-known diaries, which are adapted for use by architects, engineers, surveyors, and builders. "The Architect's Diary," Nos. 12 and 13, "The Builder's Diary," No. 11, and a "Diary and Note-book," No. 9, contain useful matter for architects and others, bound in a very serviceable manner. The scope and general get-up of these diaries must be so well known to our readers that it is unnecessary for us to make further mention of them. The same firm also send us some of their date-indicating blotting-pads, in various sizes and styles, and possessing many useful features. The Banker's Pad is apparently a new style of pad, and has been made to take a folded section of blotting-paper, which can be replaced without trouble when spoilt by use—a practical advantage for more reason than one, as we feel that users of these pads will take advantage of the means thus afforded of inserting, in place of the paper which is supplied, a material possessing some power of absorption. The daily calendar memo tablets which form part of the pads are useful features.


CITY OF GLASGOW :
PROPOSED BUILDINGS FOR THE PROMOTION OF ART AND MUSIC KELVINGROVE PARK
PLAN OF GROUND FLOOR.
CENTRAL HALL :
SOUTH SALOON
NORTH SALOON
MUSEUM HALL
WEST SALOON
WEST CENTRAL SALOON
EAST SALOON
EAST CENTRAL SALOON
TERRACE
TERRACE OVERLOOKING WEST END PARK
ADMINISTRATIVE OFFICE
PLATFORM
ORCHESTRA
FUTURE EXTENSION

"The British Almanac and Companion" for 1894 (London: The Stationers' Company) contains, in addition to the Calendar, and the usual contents relating to public offices and departments, a list of Acts of Parliament passed in the last Session, with abstracts of the more important ones. The work also contains useful information respecting the Universities and Colleges, with names of officials, and the year's events and occurrences. Information is also given as to railways, State pensions, police, and the government, &c., of foreign countries. Mr. R. Langton Cole contributes a review of architecture in 1892-3. In attempting to form an estimate of the architecture of to-day, he quotes the remark, made by Mr. J. M. Brydon during a discussion at the Royal Institute on the use of terra-cotta, "We are not doing great things—we are doing little things on a big scale," and further says "the words, if true, are applicable to modern architecture in other materials. That there is a tendency, in the work of leaders, to smallness of parts as well as refinement of detail, is undoubted, but that the buildings so designed are, therefore, not great, may with confidence be denied . . . the combination of boldness and refinement . . . has become one of the characteristics of those works of recent architecture which are most truly modern." Other reviews in the almanac are "Art," by Mr. Cosmo Monkhouse; "Engineering," by Mr. R. Langton Cole; "Drama," by Mr. J. Knight; "Music," by Mr. T. P. M. Betts; and "Science," by Mr. E. W. Maunder. The price of the work is 2s. 6d.

"The City Diary, 1894" (London: W. H. & L. Collingridge, *City Press* Office; published at 1s.), is the thirty-first annual issue of a cheap and useful almanack and diary. As one might expect, judging from the title of the diary, it contains a mass of information relating to the Corporation of London, City institutions and officers, City parishes and churches, and other information useful to City men. The diary is interleaved with blotting-paper.

"The Railway Diary and Officials' Directory for 1894" (London: McCorquodale & Co.) is another cheap and useful diary, which contains a great deal of information relating to railways. It is very clearly arranged, and forms a handy work of reference for all who are interested in railways. It is published at 1s.

"The *Indian Engineers*' Diary and Reference Book, 1894," (London: Victoria Mansions, 28, Victoria-street, S.W.) is the yearly issue of a publication which is presented to subscribers to the *Indian Engineer* (Calcutta). It is an admirably got-up work, and contains information for carpenters and builders; founders and smiths; glaziers and painters; plasterers; plumbers; slaters; also facts and formulæ relating to hydraulics, water-supply, ropes and chains, rails, and ship canals. And besides the postal and other information which is usually found in a diary, the one before us contains rules for finding areas, solidities, &c.; electrical notes; the metric system; and a short article on the preservation of timber. The diary is interleaved with blotting-paper.

Correspondence.

To the Editor of THE BUILDER.

TULLIE HOUSE, CARLISLE.

SIR,—In reference to the statement in a letter from Mr. Howard Smith, referred to in your last, I must ask permission to state that I never received from Mr. Howard Smith any sketch or design for the Castle-street front, or any suggestion from him upon it, until after the second design. The one now carried out had been submitted to the Corporation, and was consequently in his hands, for upwards of a week. The suggestion then made was in the form of a tracing, stated by the surveyor to be taken from my design, with certain modifications of his own. It was handed to me by the surveyor in the presence of the then Mayor, and you will see by the copy of my letter to the Mayor, dated October 3, 1892, that I could not accept those modifications, and that I stipulated before proceeding further with the drawings for the front, that I should furnish all details for its execution, including particulars of the colour and materials of the roof, the glazing of the windows, the nature and materials of the down spouts, and the inside of the archway as far as the inner or west wall.

If you compare design No. 2, the one submitted to the Corporation, with the working drawing of the front as carried out, you will see that they are virtually the same, and I cannot find in the Castle-street front any suggestions or hints that emanated from Mr. Howard Smith, except the vane on the top of the clock-tower which, unfortunately, was not included in the bond.

I send you particulars to verify my statement. Design No. 1 in possession of the Corporation for nearly two years. Design No. 2 practically the same scheme, modified to take an additional story; and I should like to know how it is possible to imagine that Mr. Smith, with access to these designs, should, even with the help of an accomplished architectural assistant, independently conceive a design like them—should, as far as I know, only produce it now, and should claim no credit for it. CHARLES J. FERGUSON.

Carlisle, December 19, 1893.

*** The following is the statement in regard to the Castle-street front included in Mr. Howard Smith's letter, to which we referred last week:—

"The facts as to this front are as follows:—When the property was presented to the Corporation, by a condition in the deed of gift, the elevation to Castle-street was to be erected according to a sketch which had been prepared by Mr. Ferguson (illustrated by you on May 9, 1891).

This elevation was based upon a plan of Mr. Ferguson's, which showed the Castle-street building utilised as a coffee tavern.

I afterwards suggested that it would be preferable to build a librarian's residence here, and prepared plans accordingly; the proposition was approved by my committee, and a member thereof and myself were deputed to obtain from Mr. Ferguson an amended design for this façade. We saw Mr. Ferguson, and having explained the proposed alteration, left him a tracing of a suggested design (copy enclosed) I had prepared for the front to accord with the altered plan.

This design, as you will see, was not very dissimilar to what has been carried out; but I do not, and never have desired to claim credit for this particular façade."

The obvious conclusion that most readers would draw from this is that Mr. Howard Smith had handed to Mr. Ferguson a design of his own for the alteration to the Castle-street front, that this was "not dissimilar to the one carried out" (in other words, that Mr. Ferguson had practically adopted it), but that the Surveyor was too magnanimous to take any credit for it. It now appears that Mr. Ferguson's second design had been in existence and in the Surveyor's possession for a week before the latter presented his tracing, and that Mr. Ferguson refused to have anything to say to the design on the tracing. As to the motive of the sentence we have quoted from Mr. Howard Smith's letter, and the conclusion he intended should be drawn from it, we may leave our readers to form their own opinion.—ED.

TREATMENT OF COMPETING ARCHITECTS.

SIR,—I have noticed in the *Builder* of the 16th inst. that the Sandown Conservative Club Competition is considered to have beaten the record for a close-fisted manner of dealing with the expected competitors. I think, however, if you will permit me to take up the question I can show that it is by no means such a comparatively bad case. In the first place no *deposit* is required. Then, as far as not committing themselves to be necessarily bound to employ the winning competitor, the committee are only following the usual form of conditions in England. The Americans seem to be the first to give an undertaking to employ a successful competitor. The scale 8 ft. to an inch is not unusual. The fact of the plans becoming the property of the promoters is, unfortunately, a condition too well known to need comment, but in this case it is *only* the plans taking first prize that are confiscated!

The prizes offered are miserable, no doubt—in fact, quite unprecedented. Now, Sir, may I draw your attention to the competitions just advertised for the Beveridge Public Hall, Free Library, and Adam Smith Memorial Hall, Kirkcaldy. Here the promoters want *1l.* 1s. to begin with, which will be returned to the *un*successful competitors, then plans *and* specifications are required. Finally the successful competitor is mulcted of his guinea and is offered 4 per cent. commission. Why should the "canny Scot" always want "anither saxpence?"

FAIR PLAY.

*** It was specially in regard to the ridiculous amount of premium offered (*5l.* and *2l.*) that we considered this competition exceptional. The demand for competition drawings to a working-drawing scale is no doubt an increasing habit, and ought to be protested against on every occasion. The writer does not mention the amounts of the premiums in the Kirkcaldy competition; they are *50l.*, *30l.*, and *20l.*, which rather weakens his point. On the other hand, the offer of one per cent. below the customary commission is no doubt another most objectionable innovation, and architects of any standing ought to refuse to compete under such conditions.—ED.

BATH PUMP-ROOM COMPETITION.

SIR,—Much as I admire the straightforward tone of your Note in page 445 of last week's *Builder* on what appears to be a very painful story, I still feel very strongly that the simple logic of the office of professional assessor must be to give a final and binding choice ruling equally *both sides*. If architects in competing pledge themselves (as I believe they do) to loyally accept the ruling of the professional assessor, surely the committee who invite the competition and employ the assessor should do the same; if not, why appoint such an official at all? Unless this point is fairly met and accepted by *both sides*, there is but the barest chance of escaping the heart-burnings of that old condition of things (from which we should by this time be free) when those who invited competitions were the sole arbiters, not only on the question of taste, but also of what is *far* more important—suitability of plan, and loyalty on the part of competitors to the instructions laid down as to scale and outlay,

E. SWINFEN HARRIS, F.R.I.B.A.

*** See our Note on page 463.—ED.

THE CAUSES OF BAD WORK.

SIR,—Are you not somewhat unfair to a large class of skilled craftsmen when you attribute the deterioration of workmanship to the influence of trades unions? You are surely upon much firmer ground when you "are inclined to think that a good deal of the fault lies not so much with individuals as with a system."

Many years' practical experience has taught me to consider the causes which produce bad workmanship in connexion with buildings may be roughly classed under four heads:—

1. The system of rapid building where quality of workmanship is sacrificed to rapidity of execution.

2. The system of shoddy speculative building by which men are trained to put as little labour and skill as possible into their work, but to make the work look like what it ought to be, rather than to be what it looks like.

3. The system of unlimited competition which fosters a class of builders and foremen who have no knowledge or experience of *good* work.

4. The system of "building committees," composed in too many instances of persons ignorant of building and unable to understand plans, but with keen commercial instincts which urge them to accept the lowest tenders in unlimited competition, assuming that the architect is bound to get best work done, whatever kind of builder is employed.

I believe the average artisan earns and enjoys the respect of those who fairly regard his work and the conditions under which it is done, and the skilful, painstaking works produced in some of the best builders' shops cannot fail to excite admiration and deserve the highest praise. The shoddy and scamping are almost exclusively confined to quarters where quantity is better appreciated than quality.

The real evil is deep-seated in the region where simplicity has been dethroned, and is not confined to trades-unionists.

The men would be weak and foolish indeed if they did not combine to protect themselves to obtain reasonable rates of remuneration. Although trades-unions have acted, and will probably continue to act, unwisely, the results and tendency of the combination has been good, and decidedly beneficial to the community. In time, no doubt, these organisations will improve, and the evils incidental to youthful organisms will disappear with increased experience and just treatment.

I know of nothing more calculated to bring about the elimination of bad workmanship than conferences and discussions such as the one which gave rise to your comments. You are usually so fair and impartial that I venture to hope that you will agree with me that the systems I have mentioned are much more to blame for bad workmanship than what you describe as the "organised indifference" of trades unionists.

J. OSBORNE SMITH.

*** To our correspondent's three first-mentioned causes we have several times drawn attention; among other occasions in the very article to which he refers. Our opinion as to the bad influence on work of modern trades-unions was based, as he might have seen, on the evidence of several large employers of labour. We do not for a moment suggest that bad workmanship is not to be found as well outside as inside the ranks of unionists. But we say that the trades-unions have placed before their members the object of getting as mch as possible for your work, not that of doing it as well as possible.—ED.

SIR,—The apparent partisanship that you refer to in your article of last week of Mr. Mundella in naming the witnesses of the Royal Commision, was no doubt caused by the absurd answers to his questions.

However, they were fitting replies to Mr. Owen Fleming's lament of the decadence of skilled workers; for, in answer to every one of the questions, the reply was not so much an one deploring the lack of quality as quantity—more,

more was wanted. You could read between the lines the familiar complaints, "get it done," "it will not pay," "shall lose money by the job." I have heard the same cry for thirty years, so you see, when men did more than twice as much (according to Mr. Bird) as they do now, the complaint was the same. A JOINER.

SIR,—In commenting on the very interesting discussion which took place on the above subject at the Architectural Association, you, in common with many others, "run amuck" of what is known as the levelling-down policy of Trades Unions. Pray permit me to explain the real position.

Years ago, before the Unions weilded* the power and influence they do to-day, various methods were adopted to facilitate the execution of the work in the cheapest manner possible. Men were paid all sorts of prices BELOW what was recognised as the ordinary rate. The best men only were paid this rate, and these were invariably told off to get up the quoins, cut and set the arches, &c., and in fact do all the work where the most skill was necessary; the inferior hands at the inferior prices done all the other parts of the work where less skill was required. When the front was up, or the most difficult and important work was finished, the men paid at the ordinary rate were paid off and those who worked for less wages were kept on. This system militated *against the best mechanics* who frequently had to walk about the streets in search of other employment whilst the less skilled workmen were at work.

Under these conditions there was every incentive for a man *not* to become a skilled mechanic; side by side with this came the sub-contracting system, where the same methods were adopted, though generally in a much worse form, where every incentive was given to scamp the work; then came the introduction of that sham called "*pointing*," whereby rough and shoddy material and inferior workmanship was smudged, daubed, and veneered over with a view to making it look as near like a genuine article as it is possible to make a counterfeit appear. These and many other evils were allowed to grow year after year untill not only did the workmen become demoralised, but the employers and all connected with the Building Trades became of one feather. Cheapness, the idol of the British Public, became the first and generally the only consideration, whilst quality was seldom considered at all.

For all the years that this has been going on, and the Building Trades fast going to the dogs, practically nothing has been said about the quality of the work deteriorating, untill it is discovered that the men do not lay as many bricks as they formerly did, when the Architects discover that the quality of the work is not as good as it should be, and then both Builders and Architects (with a few brilliant exceptions) agree that the Unions are responsible for all the evils of which they complain. A greater mistake than this has never been made.

It is the action of the Unions in endeavering to remedy the evils from which (we know we suffer) that has brought about the climax. The Unions have recognised that unless something was done to raise the standard of workmanship and crush the evils by which we have too long been cursed, that we should drift from bad to worse, and they therefore determined, by a vote taken, not to countenance the production of shoddy or inferior work in any shape or form, and the result is that the quality of the work done in London this last eighteen months has generally improved, and the quantity performed is naturally somewhat less, and this is therefore the whole crux of the question. The old system meant the survival of the unfittest, but the new system means the survival of the fittest. By fixing a minimum wage the best skilled has the best chance, as it is his reward to be chosen and to be kept at work, and the inferior man is discharged first, which fact should certainly act as an incentive to the inferior to become a superior workman, and I may here add that there is no rule to prevent a man receiving more than the minimum wage except the rule of the employers not to give more.

I presume, Sir, that you will agree with me when I say that in discussing these questions it is always best to discuss them from a purely scientific point of view, apart from all prejudice and personality, and probe them to the bottom if we would deal with them at all.

Mr. Fleming complains (and justly so) of the slipshod character of the work and the faulty materials, but he must remember workmen have to obey instructions, and they have no choice in what materials they use.

Much stress was laid upon the fact of the plumbers having made progress during the last few years, and why have they been able to do so? Because public attention has been rivetted to the fact that bad sanitary arrangements, bad joints in soil pipes, &c., are closely associated with typhoid fever and diptheria, and most of the terrible scourges that "flesh is heir to." Once persuade the public conscience that bad joints in brickwork or woodwork will be attended with the same dire result, and shoddy building and inferior workmen will speedily become things of the past.

The Unions have heavy responsibilities, and they can bear them; they are making for progress, and we sincerely believe, prosperity. Thanks to them the workers are slowly but surely working out their own emancipation, and if their aims, objects, and methods are not in accordance with every one's ideas that is no concern of ours, we shall still go on our way; we have Time on our side, and we are working to mould a brighter and happier Future.

Our critics must condemn us if they will, and believe we are as black as we are painted, that we are as demoralised as represented, but I do hope they will, nevertheless, remember how little they have done to make us otherwise.

H. R. TAYLOR.

SIR,—Apropos of the discussion as to London Workmen, reported in your last issue; having just completed a contract within the London district, we are in a position to confirm the remarks made as to the large percentage of incompetent workmen and enormous cost of work generally.

The following figures, taken from our books for this one contract only, may be of interest:—

Bricklayers—85 men, out of a total of 215 set on, discharged for incompetency, not earning their wage, or keeping bad time. Carpenters—18 out of 53. Plasterers—14 out of 22. Plumbers—2 out of 16. Labourers—77 out of 212.

The percentages in the various trades can be easily calculated, and, with regard to the bricklayers especially, more would have been discharged had we been less pressed for time.

With regard to cost, the plastering, all of the plainest description, proves to have cost just half as much again as a fair piece-work price, and the labour on the brickwork, inclusive, at least 3*l.* per rod more—after allowing for difference in rate of wages—than exactly the same description of work cost us in the country.

In conclusion, we may say that no amount of indignant protestation on the part of Alderman Taylor or other officials connected with trades unions will alter our conviction that there is a rule—unwritten, perhaps, but strictly enforced—which has the effect of reducing the energies of the workmen to a certain low standard, fixed, we should say, as nearly as possible, at the irreducible minimum.

BROADMEAD.

NATIONAL ASSOCIATION OF OPERATIVE PLASTERERS.

SIR,—The above high-sounding title may cover a multitude of sins.

In the monthly report of this Association for March last they give 2,448 paying members for London and the suburbs, and 4,034 for the provinces and other parts of the country, and yet, at the Workmen's Exhibition, held at the Agricultural Hall, when prizes were offered for exhibits of superior workmanship only *one* plasterer sent in a *bonâ-fide* exhibit of plasterers' work, and he might not have been a Unionist. Further comment would be useless.

A VISITOR.

QUANTITY OF WATER REQUIRED FOR FLUSHING WATER-CLOSETS.

SIR,—In your last week's edition you draw attention to the very valuable set of experiments made by a Committee of the Sanitary Institute at the request of the London County Council with a view to ascertain the quantity of water required to efficiently flush a water-closet, and it is to be greatly regretted that these experiments have not been further extended. Apart from the quantity necessary for an efficient flush, they also throw light on the relative merits of 4-in. as against 6-in. pipes, and it is in reference to this point that more information is required. The conclusion to be drawn from the experiments does not seem to confirm the opinion frequently held, that the flushing power, with the same quantity of water and the same gradient, is greater in a 4-in. than in a 6-in. drain. If, for instance, the case of a 4-in. pipe, 26 ft. and 50 ft. long, and laid at a gradient of 1 in 40, is compared with that of a 6-in. pipe under like conditions, it will be found that a 4-in. pipe, 26 ft. long, has, with a flush of 2 and 2½ gals., a slightly greater scouring power than a 6-in. pipe, but that this advantage disappears as the length of the drain increases, and that when this has reached 50 ft. the 6-in. pipe has a distinct advantage over the 4-in. pipe. With a flush of 3 gals., however, the 4-in. pipe maintains its slight superiority over the 6-in. pipe, even when extended to 50 ft., as the following table shows:—

Quantity of water used for flushing. Gallons.	Length of drain. Feet.	Difference between 4-in. and 6-in. pipes.	Length of drain. Feet.	Difference between 4-in. and 6-in. pipes.
2	26	7 per cent. in favour of 4-in. pipe.	50	15 per cent. in favour of 6-in. pipe.
2½	26	4 per cent. in favour of 4-in. pipe.	50	18 per cent. in favour of 6-in. pipe.
3	26	6 per cent. in favour of 4-in. pipe.	50	5 per cent. in favour of 4-in. pipe.

To put the case shortly, from the experiments it would appear that the advantages of a 4-in. pipe over a 6-in. pipe in a 26-ft. length of drain are but slight, and that in a 50-ft. length of drain a 6-in. pipe has distinct advantages over a 4-in. pipe as far as the scouring power is concerned. If this deduction is correct, then it would be an advantage in future to employ 6-in. pipes instead of 4-in. pipes, as the area of a 6-in. pipe is more than twice that of a 4-in. pipe, and its extra cost over a 4-in. pipe not very considerable.

As this result is somewhat contrary to what has generally been accepted, and as this matter has attracted a great deal of attention, it is greatly to be hoped that the Sanitary Institute will see its way to take up these experiments again, and enlarge their scale so as to throw full light upon this important question. H. ALFRED ROECHLING.

Leicester, December 19, 1893.

SIR,—As one who for years back has been condemning the dangerous and unhygienic pseudo-water-saving policy of restricting the water-flush of a closet to only two gallons, will you permit me to express the satisfaction I felt at reading the article on this subject in pp. 444-5 of the *Builder* for the 16th inst. The experiments made by the Sanitary Institute amply confirm what I often have said, that the two-gallon flush did not cleanse the closet properly, while it often simply deposited the soil in the drain, and left it there to generate foul gases, to the detriment of the atmosphere in the neighbourhood. I sympathise entirely with you in your advocacy of the four-gallon flush as the maximum, while no flush should be less than three gallons.

W. P. BUCHAN.

REDRESSED SANDSTONE.

SIR,—I shall be obliged if any of your readers can tell me how to preserve the face of redressed sandstone, and if linseed-oil is a good thing.

J. G. ALLOTT.

ANTWERP INTERNATIONAL EXHIBITION, 1894.

SIR,—In your issue of the 9th inst., under the heading "Belgium," you give certain information in regard to the Antwerp Universal Exhibition next year, and in mentioning the name of Mr. de Courcy-Perry you state that "he will act in his private capacity as the agent of the British exhibitors."

I am directed by the Commissioner-General to say that you have been misinformed.

As H.B.M. Consul-General in Belgium, Mr. de Courcy-Perry cannot undertake any private business of any nature whatsoever.

With the authorisation of Her Majesty's Government, the Consul-General has been appointed Commissioner-General of the British section, and in this capacity will watch over British interests at the forthcoming exhibition. He will have nothing whatever to do with private interests.

Kindly publish this letter in your next number, of which the Commissioner-General will be glad to receive a copy.

WILLIAM LAYTON,
Secretary to the British Commissioner.

The Student's Column.

GEOLOGY.—XXVI.

THE present article will be devoted to the consideration of various miscellaneous minerals, rocks, and substances used by architects either in the manufactured form, or in the natural state, and which have not been previously adverted to in the connexion indicated.

Sand is typically composed of minute grains of quartz loosely compacted, which may be angular, sub-angular, or rounded. It is commonly mixed with more or less foreign matter, such as particles of felspar, mica, &c. When very pure it may be manufactured into glass, and has been largely exploited for that purpose. The principal use of sand to the builder is in making mortar, when the angular (sharp) varieties are chiefly called into requisition—at least in making good mortar. As an ingredient of artificial building stones it is extensively used, especially on the Continent. A mixture of fine sand with a very small proportion of clay, is dug for casting purposes. Sharp sand is much employed in sawing certain building stones. Firmly compacted by pressure, or bound together by some cementing mineral it forms sandstone; when the latter has frequent beds (determined in many instances by layers of flakes of mica) and is more or less fissile, we get flagstones.

Clay, when pure, is a hydrous silicate of alumina, perfectly white, and has resulted from the decomposition of felspar. The majority of clays, however, contain much foreign material,

* We print this letter as sent, spelling included.—ED.

and are mostly stained by iron. The white or light grey varieties are largely manufactured into terra-cotta, and great care is expended in the preparation of the material for that purpose. Certain clays are suitable for making bricks, tiles, earthenware drain-pipes, &c. Brick clays are very widespread; they contain sand, lime, iron and a host of impurities. The proportion of free quartzose sand in the clay, as well as the actual composition of the clay itself admit of great variety. A good brick clay should not contain much iron, lime, potash, or soda, but sand is essential.

Fire-clay is a name given to varieties of clay that will bear intense heat without running or melting in the kiln, and the fire-bricks made from it will also bear exposure in the interior of furnaces. It is obtained in large quantities and is extensively worked near Stourbridge, Newcastle-on-Tyne, and in the neighbourhood of Glasgow—also in Yorkshire, Staffordshire, and Glamorganshire. In the counties of Durham and Northumberland it usually lies beneath the Coal Measures in layers varying in thickness from 1 ft. to 5 ft. or 6 ft. Chemically, it is composed (like ordinary clay) of silica and alumina; the refractory character of any sample of fire-clay is determined by the proportions in which these two ingredients are contained and by the absence of lime, iron, or other easily fluxible substances. According to Mr. Joseph Cowen,* the best descriptions of fire-clay—those which, when manufactured, are capable of resisting the greatest heat—always contain a large proportion of silica. The following chemical analyses refer to the composition of the material raised (1, 2 and 3) near Newcastle-on-Tyne, (4) at Stourbridge, and (5) at Glasgow:—

Chemical composition of Fire-clays.

	1	2	3	4	5
Silica	51·11	51·10	83·29	51·80	65·20
Alumina	30·40	31·35	8·10	30·40	33·41
Oxide of Iron...	4·91	4·63	} 1·88	4·14	·49
Lime	1·76	1·46	}	...	·32
Magnesia	trace	1·54	2·99	·50	·13
Phosphates.....	...	...	...	...	·45
Water and Organic matter	12·29	10·47	3·64	13·11	...

It is not only for lining furnaces and making retorts that fire-clay is employed; the low-priced fire-bricks have, for many years, been used for ordinary building purposes, and the raw material in the manufacture of chimney-tops, flower-vases, pipes, &c.

Lime is made by calcining limestone; as there are different kinds of limestone, more or less impure, it necessarily follows that limes are also very variable, having widely different qualities and properties. They require special treatment to obtain from them the best result. The purest carbonates of lime, such as statuary marble or chalk, make what is called a rich lime, setting firmly only in dry air, whilst the impure carbonates, in which clay is largely mixed with the limestone, result in the production of what are known as hydraulic limes, which set more or less rapidly in moist air, or even under water. The student will understand from this that special properties may be imparted to a lime by the admixture of foreign substances in the manufacture of cement, mortar, and stucco. The late Professor Ansted divided† limes into five classes, as follows:—(1) Rich limes, (2) poor limes, (3) moderately hydraulic limes, (4) hydraulic limes, and (5) eminently hydraulic limes. Rich limes are obtained from the purest and hardest limestones that do not contain more than from 1 to 6 per cent. of silica, alumina, magnesia, iron, or other foreign substances. Poor limes are obtained from limestones in which these impurities are present to the extent of from 15 to 30 per cent. It is considered that fossiliferous limestones make bad mortar, as the slacking is irregular. Limes containing much silica swell in setting; on the other hand, where alumina is in excess, the lime is apt to shrink and crack. Hydraulic limes are of many kinds, and of great value for constructional purposes. They are obtained (*a*) by burning certain varieties of calcareous rock; or (*b*) manufactured artificially by mixing limestone with the requisite foreign ingredients or (*c*) by combining quicklime with other materials. It is generally considered that from 15 to 25 per cent. of a limestone should consist of silicate of alumina, in order that it may burn into a good hydraulic lime. The concretions called "septarian nodules" in the London Clay, and in several clays of Jurassic age, are eminently suited to the purpose; whilst the hard calcareous bands in the Lias at Barrow-on-Soar and elsewhere have for many years yielded cement of excellent quality. Very good hydraulic cement is made by the artificial admixture of the river mud coming from calcareous and argillaceous districts, with chalk before burning.

Iron is very widely disseminated on the surface of the earth, though except as museum specimens it is rarely seen in its native condition, occurring mostly as oxides, carbonates, &c. Valuable ores of iron, however, are not particularly common. The richest are the protoxides; the next the peroxides; and the least rich, but most abundant, the carbonates of the oxide. Magnetic iron, a mixture of protoxides and peroxides, is not abundant enough in this country to be worked as an ore; but in Norway, Sweden, Russia, and the United States, it commonly occurs. Hæmatite, a peroxide, is found principally in the Carboniferous Limestone of the North of England, especially in Cumberland. Hæmatite is also obtained from Derbyshire, the Forest of Dean, Somersetshire, and South Wales. It is a very rich ore, but is frequently mixed. for commercial purposes, with the carbonates and poorer classes of iron. By far the greater number of iron ores are impure, earthy, and carbonaceous minerals, amongst which iron oxide occurs to so large an extent as to be worth reducing; they are worked, principally, in the Coal Measures and Lias formation. The clay ironstones are various shades of brown and orange, to purple and black, and it is fortunate that they are found in such close proximity to coal. The ironstone of the Lias in the Cleveland district is well-known; the main seam is practically inexhaustible. The relationship existing amongst the earthy constituents of this ore varies somewhat in different localities; indeed, the seam itself in the same section is by no means uniform in composition. The Northampton Sand, a member of the Jurassic series, contains an iron ore which is raised near Kettering, and other parts of the county whence the formation derives its name. At Westbury, in Wiltshire, beds of Corallian age are also actively exploited to obtain iron ore; it is put into the furnaces with a certain amount of coke, and some of the Coralline oolite as a flux. The slag is utilised for building purposes and road metal, whilst paving material is made with the help of cement.

Lead is for the most part found in veins or lodes. There are many different kinds of the metal, but by far the most abundant is galena, or sulphide of lead, the chief commercial ore. A chemical analysis of this shows:—

Lead	85·13
Iron	·50
Sulphur	13·02

Galena occurs in rocks of different geological ages from the Cambrian to the Triassic; also in granite. Cornwall, Cardiganshire, Cumberland, Denbighshire, Derbyshire, Durham, Northumberland, Flintshire, Shropshire, Westmoreland, and Yorkshire are counties in which it is at present being extensively worked; but a large proportion comes, in addition, from the Isle of Man and parts of Scotland.

Tin is obtained in Cornwall and Devon from lodes, or veins. In times gone by, a considerable quantity of the metal was derived from superficial deposits, &c., and this is called stream tin. The method of washing the tin streams was very simple, and the rude utensils employed were usually fashioned out of hard wood. The whole of the tin found in the drift was, like the drift itself, the product of denudation, the tin having come from the decomposition of the lodes that once contained it. The stream tin generally reposes directly on solid rock, and is often in a remarkably clean condition, with but little admixture of gravel. The ore from some lodes* is so rich as to require but little preparation for the smelter; but practically all the tin-stone has to be stamped and dressed. As many mines produce tin-stuff containing only one or two per cent. of tin, the numerous washings which it undergoes result in a considerable loss of fine tin-ore, which certainly equals, if it does not exceed, a fifth of the tin that the vein-stone originally enclosed. The metal is largely employed in the tin-plate trade; is mixed with lead to form pewter; with copper to make bronze; and with copper and zinc to make brass, bell-metal, &c.

Copper is more widely diffused than tin: is much more malleable than ductile. The richest of the ordinary ores appear under two aspects; the first has a metallic lustre, a copper red, brass yellow, iron grey, or blackish grey colour, sometimes inclining to blue; the second is without metallic appearance, has a red colour, verging upon purple, blue, or green, the last-mentioned tint being the most usual. The deposits of copper in Cornwall occur as veins in granite; those in the Isle of Anglesea, of Westmoreland, Lancashire, and Cumberland, of the south-west of Scotland, the Isle of Man, and south-east of Ireland occur in the Archæan and older Primary rocks, sometimes in masses, but more frequently in veins. Practically all the copper ore mined in England at the present day comes from Cornwall and Devon.

Zinc is raised principally in Cumberland, Denbighshire, Flintshire, Cardiganshire, and the Isle of Man. It may be described as a bluish-white metal, of considerable lustre when broken, but easily tarnished on exposure to the air. Commonly known as "spelter"; when pure it is malleable at the ordinary temperature, whilst commercial cast-zinc is brittle.* Zinc forms with other metals a most important class of alloys, such as brass, German silver, &c. It is used in the form of sheets, worked into a variety of shapes; it protects iron from rusting, as in galvanised iron; whilst it forms the electro-positive element in many batteries.

Arsenic occurs native, in veins in very ancient rocks; it is found in the state of oxide, also combined with sulphur, &c. Cornwall and Devon are the only counties producing it at the present time. It is employed principally in the manufacture of glass, and to a certain extent also, by some, in colouring wall-papers.

GENERAL BUILDING NEWS.

PUBLIC BATHS, BACUP.—These baths were opened on the 16th inst., by Mr. J. H. Maden, M.P., having been presented to the Borough of Bacup by his late father. The baths have been designed and carried out by Messrs. Mangnall & Littlewoods, architects, Manchester, selected in a competition, the cost, including land, being about 10,000*l*. They are situated in Rochdale-road, and include first and second class swimming-baths, first and second class men and women's slipper-baths, and Turkish baths, the contractor for the main structure being Mr. James Hargreaves, Bacup; hot and cold water engineering, Messrs. Jaffry & Co., Manchester; steam service and laundry engineering, Messrs. Elliott & Sons, Manchester; the steam boilers and pumps, Mr. Edward Wood, Manchester; Mr. Corcoran, of Manchester, acting as clerk of works. Each entrance is of sufficient width for double turnstiles in and out. The women and first-class men use one entrance and the second-class men the other. The laundry and washhouse with drying closet are placed over the boiler house, which is provided with two boilers. There are six slipper-baths for women. The first-class swimming bath is 60 ft. 3 in. by 37 ft. 5 in., with a water space of 50 ft. by 20 ft., with dressing-boxes on each side, also foot-bath and shower, with water-closets and urinals. The second-class bath is 89 ft. by 42 ft., with a water space of 75 ft. by 24 ft., with a sufficiency of dressing-boxes arranged on each side, also with foot-bath and shower, and two water-closets and urinals convenient thereto, and narrow staircase to approach the gallery. Each swimming-bath is lighted from the roof with inclined and vertical lights. A narrow gallery has been erected on each side of the second-class baths for visitors. The laundry is placed over the boiler-house, and has a concrete floor. It is fitted with drying closet. The design of the building is English Renaisance. The front and two principal side elevations are faced with Yorkshire parpoints, backed up with common brickwork—and Yorkshire stone used for the Ashlar work. The steps, flags, and copings are from the neighbouring quarries.

PARISH HALL, RYTON, DURHAM.—A new Parish Hall has just been opened at Ryton. The building, which stands on the top of the Station Bank, has been erected at a cost of 1,350*l*. Sitting accommodation is provided for about 400 people. The hall has been erected by Mr. W. Lishman, of Blaydon, from designs prepared by Mr. Crawford Hicks, architect, of Newcastle.

CATHOLIC CHURCH, SUDBURY.—This church, of which the foundation-stone was laid by Dr. Riddell, Roman Catholic Bishop of Northampton, on June 27, was opened a few days ago. The building consists of the church itself, with lady-chapel adjoining, and a large room beneath, which can be used for various purposes. It communicates with the presbytery and the residence of the mission priest. Mr. L. Stokes, of London, was the architect, and Messrs. Grimwood & Sons, of Sudbury, the builders.

SCHOOL BUILDINGS, WOLSTANTON.—The Wolstanton School Board have instructed Mr. A. R. Wood, of Tunstall, to prepare plans for a new board school at Wolstanton, and another school at Tunstall—each for about 800 children.

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* "Industrial Resources of the Tyne, Wear and Tees," 1864, p. 203.

† "Applications of Geology," 1865, p. 134.

* See Brenton Symons, "Geology of Cornwall," 1884, p. 172.

* A. H. Hiorn's "Mixed Metals," 1890, p. 35.

NEW POLICE OFFICES, ROTHERHAM.—Fifteen Cells, Police and Sessions Courts, &c., together with Municipal Offices and Council Chamber for 45 members, are about to be erected at Rotherham, Yorks, from the drawings and under the superintendence of Mr. Richard J. Lovell, of London, whose plans were selected in competition.

CHURCH, RHOS, PEMBROKE.—The new church of St. David, Rhosllanerchrugog, was consecrated on St. Andrew's Day by the Bishop of St. Asaph. The church is situated in central Rhos, and is intended for Welsh services. It was designed by Messrs. Douglas & Fordham, architects, Chester, and built by Messrs. Jenkins & Jones, of Johnstown. The Bishop also re-opened St. Mary's iron church, Johnstown. This church has been rebuilt by Mr. Sothern, of Wrexham, and is intended to serve the English population at Johnstown. The gross cost of the two churches and sites is 2,300*l.*

NURSES' HOME, BURMANTOFTS, LEEDS.—The four corner-stones of the new Nurses' Home, which is being erected in connexion with the Leeds Union Infirmary, were laid on the 14th inst. Mr. Thomas Winn, of Leeds, is the architect. The building will be on the block or wing principle. There are to be forty separate sleeping apartments, located for the most part in the two wings. The matron's rooms will be in the centre, one-story block; and in this portion, too, will be two sitting-rooms, one for the regular trained nurses and the other for the probationers. In a separate one-story block behind the main building will be a kitchen, scullery, and dining-room. The corridors will be fireproof, and at the ends of the two wings iron fire-escapes will be placed. Water mains, with proper fire-extinguishing appliances, will also be provided on the several landings in the building. The total cost, including furnishing, is expected to be rather under 10,000*l.* The contractors are—Messrs. Thompson & Sons, building; Mr. Banks Mawson, joinery and carpentry; Mr. George Thompson, plumbing and glazing; Mr. Robert Branton, plastering; Messrs. Walker & Sons, painting; Mr. James Seasons, slating; and Messrs. J. & U. Smith, ironfounding. Mr. T. J. Boothman is the clerk of the works.

DISPENSARY, STOURBRIDGE.—The new dispensary in Worcester-street, Stourbridge, was opened on the 14th inst. The building, which has been erected by Mr. North from plans by Mr. Tom Grazebrook, is of red brick, relieved with stone facings and carved bricks.

PROPOSED FREE LIBRARY, NEWCASTLE.—At a recent meeting of the Newcastle-on-Tyne Corporation, a letter was read from Alderman Stephenson, offering to build, at his own cost, a branch free library on the north side of Elswick Park. The offer was accepted. The building will be erected from designs by Mr. J. W. Dyson, architect, of Newcastle, and will provide on the ground floor public restaurant, conversation-room, large reading-room, two ante-rooms, lavatory, &c., and on the upper floor a hall 70 ft. by 35 ft. for branch library and public meetings, and also two small rooms. The estimated cost is about 4,500*l.*

LECTURE HALL, MOUNTPOTTINGER, BELFAST.—The new lecture-hall in connexion with the Mountpottinger Presbyterian Church, Belfast, was opened on the 14th inst. The hall is a two-story structure, erected at the rear of the church by Messrs. Campbell & Lowry, from the designs of Mr. T. Roe, architect, and it contains, in addition to the hall proper, which is on the second story, a minor hall, a committee-room, a minister's room, a library, and a kitchen.

NEW WING.—STAFFORDSHIRE GENERAL INFIRMARY.—The new north wing of the Staffordshire General Infirmary at Stafford has just been opened. Mr. Aston Webb, of London, has been the architect, and the builder was Mr. F. Espley, of Stafford. The new building has a total frontage of about 85 ft. to the main street, and is a two-storied building, being erected on an under-structure of arches. The front elevation is of red brick and cement stucco, with twelve narrow windows on each floor, 10 ft. 3 in. by 3 ft. The building is connected to the old infirmary by a covered passage, and can be entered also from the grounds at that end by a staircase, whilst at the other end at the rear there is an external winding staircase of iron. There are two wards, one above and one below, 58 ft. by 24 ft., each containing fourteen beds. The wards are 13 ft. high. At the end of the building adjoining the old infirmary are ward kitchens.

ALTERATIONS TO HOSPITAL, TORBAY.—On the 15th inst. Torbay Hospital was re-opened after alterations. The outer walls and the basement remain the same, but so complete has been the remodelling that the hospital is practically a new one. The first and second floors, with the ground floor, have been entirely remodelled, while a third, consisting solely of bedrooms, has been constructed. Upon the ground floor is placed the Board-room, the sitting-rooms for the house surgeons, the matron's store and sitting-room, a waiting-room, and a minor accident operating-room, while at the southern end there is a ward, 45 ft. by 25 ft., capable of accomodating thirteen beds. Above this is another ward for twelve beds, and at the opposite end of the building a third for eleven beds. Between these are rooms for the matron and nurses, a single-bed ward, and servants' stores, and a corridor runs the whole length of the floor. Another eleven-bed ward, called the "Florence Nightingale" ward, is over this, as well as the principal operating-room and two isolated wards. The floors and skirtings of all the wards are of teak. Tobin's system for the inlet of fresh air has been adopted, whilst the vitiated air is conveyed from the ceilings of each ward by zinc pipes to the lower, where an up-draught is created by coils of hot-water pipes. Dinner-lifts are attached to each end of the building, the grates are fitted with Dr. Teale's patent for heating the rooms, and the wards are connected by speaking-tubes. At the rear a new mortuary has been erected. The contract price was 6,201*l.*, but it is estimated that the total cost of the alterations and furnishing will reach 9,000*l.* Altogether 60 beds are provided, and accomodation for twelve nurses. The architects are Messrs. Habershon & Fawckner, London; Mr. J. Chudd, Torquay, was contractor, and Mr. Jackman, St. Marychurch, did the carving.

ST. HUGH'S CHURCH, LINCOLN.—This church was opened by His Eminence Cardinal Vaughan, Archbishop of Westminster, on the 19th inst. The style of architecture is Early Gothic. The walls are of brick, faced externally with Greetwell stone; the inside is plastered, to admit of future coloured decoration. The dressings are of Doulting stone; the columns on the exterior and to the nave are of red Corsehill stone, the latter having Portland stone caps and bases. There is seating for 500 worshippers. The nave is 87 ft. long, with processional aisle and chapel on each side. The sanctuary is 30 ft. by 30 ft., giving a total internal length of 117 ft. The organ chamber, overlooking the sanctuary, is 21 ft. by 20 ft. The baptistery, sacristies, &c., are suitable to the church. The tower and spire rise 140 ft. above the ground. The architect is Mr. Albert Vicars, of London, and the builders are Messrs. H. S. & W. Close, of Lincoln.

SAILORS' HOME, ABERDEEN.—The directors have approved of plans for the enlargement of the present Sailors' Institute, in James-street, so as to make it more suitable as a sailors' home. The scheme involves the erection of a new block fronting Mearns-street and the heightening of the connecting wing from one to three stories. According to the new plans, the ground floor will contain a large sailors' café, lounge, smoking, waiting, and luggage-rooms, lavatories, &c., with kitchen and ample accommodation for the keeper. The first floor contains a hall, chapel, and board-room, with retiring-rooms, lavatories, &c.; the second floor, navigation school and class-rooms, eleven private bedrooms for sailors and officers, with bath-room and lavatory accommodation; the third floor contains additional dormitories suitable for shipwrecked crews. The new front to Mearns-street will be built entirely of white granite. The front to James-street will be considerably improved by the addition of large bay windows. The chairman of the directors, who has taken an active interest in the matter, is Sir William Henderson. The architect is Mr. James Souttar, Aberdeen.

THE "HUGH MYDDELTON" SCHOOL.—This school, which was opened by the Prince of Wales on the 13th inst., stands partly on the site of the House of Detention, in Clerkenwell, which was built to replace the old Bridewell Prison in the year 1775, rebuilt in the year 1818, and was further enlarged in 1845. The prison being very old and in a crowded neighbourhood, and subject to many disadvantages, was closed in 1886; and as school accommodation was needed in the locality of the prison, the School Board agreed to ask the Home Office to reserve for sale to them a portion of the site of the House of Detention with a view to the erection of a school upon it. After prolonged negotiations with the Home Office, the Treasury, and also with the Prison Commissioners, the Board succeeded, in December, 1887, in arranging for the purchase of the freehold of the whole of the site of the House of Detention, containing an area of 2⅛ acres, with all the buildings thereon, for the sum of 20,000*l.* This purchase was completed in June, 1888, and the buildings standing on the site were pulled down in 1890, that portion of the old materials not utilised by the Board being sold for 1,288*l.* 10s. The erection of a school for 2,000 children on this site was sanctioned by the Education Department in January, 1888, the contract price being 41,492*l.* The school is built in three departments—for boys, girls, and infants—each department being on a separate floor, and access to each floor being obtained by two staircases. Each department of the ordinary day school consists of ten class-rooms, with a large central hall, about 79 ft. long by 37 ft. wide, and is fully equipped with cloak-rooms, lavatories, rooms for teachers, &c. The school is heated throughout by low-pressure steam-pipes and ventilating radiators, extracts for foul air being provided by brick shafts. Each class-room is well lighted from the left. The two lower stories are of the usual London stock brick, with red brick dressings and window arches, the upper stories being of cream-coloured terra-cotta with red tile roofs. The main building is erected upon the foundations of the old prison, some of the cells of which have been preserved intact. The contractors for the building were Messrs. Bull, Sons, & Co., Limited, the Architect was Mr. T. J. Bailey, F.R.I.B.A., the Architect to the Board, and the clerk of the works was Mr. J. McKillop. The warming arrangements have been carried out by Mr. John Grundy.

SANITARY AND ENGINEERING NEWS.

WATER SUPPLY, LONGTON, LANCASHIRE.—At the Poor Law Offices, Longton, on the 5th inst., Major-General H. P. Crozier, R.E., inspector of the Local Government Board, held an inquiry into the application of the Rural Sanitary Authority for power to borrow 10,000*l.* for the purpose of a water supply to Howick Hutton, Little Hoole, Longton, Much Hoole, and Penwortham. Mr. Myres, of the firm of Messrs. Myres, Veevers, & Myres, engineers, explained the scheme, which included the laying down of a 9-in. pipe over Penwortham Bridge to Cop-lane, a 6-in-pipe on to the "Golden Ball Inn," and 4-in. pipes throughout the other parts of the district. The cost of the work would be 9,144*l.* There would be about 3,000 people along the lines of pipes and 595 houses would be served. Witness was of opinion that the water supply would lead to the development of the district as a suburb of Preston. During the proceedings the Inspector remarked that the Local Government Board knew the need of a water supply, and the only surprise was that the Sanitary Authority had not met it. The Clerk said the people of the district were afraid that a water supply would increase their rents, and that was the chief reason the work had not been done. The estimate of the cost was made up by 7,051*l.* for the work, 353*l.* engineer's fees, 740*l.* for contingencies, and 1,000*l.* for an extra 6-in. main down Pope-lane and Sheep Hill-lane. Dr. Trimble, Medical Officer of Health for the district, spoke of the urgent necessity for the water supply. He said that in Longton, with a population of 7,000, there were only two wells, one at the brewery, and the other at the house of the owner of the brewery. Mr. Cox said there was already too much good water at Walmer Bridge if people would only look after it. They should take it off the slates. The Inspector: My good man! Rain water in the year 1893! The Inspector afterwards visited the district proposed to be supplied with water.

PROPOSED RAILWAY EXTENSION AT WARRINGTON.—It is expected that not very long after the opening of the Manchester Ship Canal, the first stage in another somewhat large undertaking will be entered upon in Warrington. We (the *Warrington Guardian*) stated some time ago in these columns that the directors of the London and North-Western and the Great Western Railway Companies had under consideration a proposal to expend a sum of 70,000*l.* in alterations at Bank Quay Station, and we now understand that the plans for the work have been approved, and as soon as the award in the arbitration case between the trustees of the late Lord Winmarleigh and the London and North-Western Railway Company is announced, which will be in the course of a fortnight, a commencement will be made.

RADSTOCK WATER SUPPLY.—For several years past the water supply of this little Somersetshire town has been very deficient, and the Local Board, after giving careful consideration to several schemes submitted by the Surveyor (Mr. Martin), instructed him, in February of this year, to prepare plans for a supply by gravitation from Downhead, a village on the Mendips, situate about seven miles from Radstock. This scheme, after being favourably reported on in April by Mr. J. E. Willcox, C.E., of Birmingham, was submitted to the Local Government Board. A public inquiry was held on July 28 by General Carey, R.E., and a provisional approval of the works was given the following October. The springs are situate on lands belonging to Lord Portman, who has leased them for a term of seventy-five years. Their height is 666 ft. above sea level, and their minimum volume, as registered in September of this year, was 160,000 gallons in twenty-four hours. The works comprise a small storage reservoir to contain one day's supply, but sufficient land has been acquired to construct a large one when necessary. The main will be just over six miles in length, beginning at 10 in., having an intermediate length of 8 in., and finishing at Radstock with pipes 6 in. in diameter. The distributing mains range from 5 in. to 3 in. in diameter, and comprise a length of over four miles. The head of water in the town will range from 400 ft. to 200 ft. Tenders for the various works were opened on November 24, and, after being tabulated, were settled at a meeting of the Local Board held on December 15. A list of the tenders will be found in another column. The scheme is estimated to cost 10,000*l.*, and the district contains less than 4,000 inhabitants.

FOREIGN AND COLONIAL.

FRANCE.—The Municipal Council of Paris has voted a gold medal to be presented to M. Jules Cousin, the founder and curator of the Carnavalet Museum, on his retirement from office.——The competition for the diploma of architecture at the École des Beaux-Arts this year has been a remarkable one. Eighteen competitors have been admitted, and among the works exhibited we may especially mention a design for a clinical hospital by M. Valentin and one for a church by M. de Mourclos.——An interesting exhibition of photographs of Roman remains in Algeria has been organised at the Trocadéro. The collection, which will be open till the end of the year, was commenced in the first instance to furnish illustrations for M. Albert Ballu's lecture on the architectural remains at

Tebessa, Lambessa, and Timegad.——The Greek church at Paris, rue Bizet, is shortly to be opened. ——M. Bouillon, the sculptor, has just completed the model for the marble bust of Dr. Guillotin, commissioned by the State for the Galerie de la Révolution at the museum of Versailles.——At Pau a statue of Maréchal Bosquet is to be erected, which will be a reproduction in sculpture of the portrait of him by Horace Vernet.——M. Marcel Jacques, the sculptor, is at work on a monument to the painter Millet, which is to be erected at Gréville, Millet's birthplace.——The town of Remiremont (Vosges) has opened a competition for the construction of a theatre, a group of schools, and a gymnasium. —— The town of Aurillac has put up to competition the restoration of its Hôtel de Ville and the construction of three school-houses.——At Perigueux a competition has been opened for the construction of a public museum and library.——MM. Pierre Gavault and Bruno Jouve, architects practising in Algeria, have obtained the first premium in the competition opened by the town of Djelfa for the construction of a new Hôtel de Ville.——M. Du Bousquet, chief engineer of the Nord Railway Company, has been elected President of the "Société des Engénieurs Civils."——The works necessary for deepening the harbour of Toulon will be commenced shortly.——There is talk of transporting to the Place du Panthéon, to form a pendant to the statue of Rousseau there, the statue of Voltaire now at the angle of the Institut. This statue would in that case be replaced by that of d'Alembert, as a pendant to that of Condorcet which is to be placed at the opposite side. The changes will probably be made in the course of the spring.——A competition has been opened, for all architects and engineers of France, for designs for the buildings for the General Industrial and Art Exhibition which is to be held at Bordeaux in the spring of 1895——The members of the Jury of the Section of Architecture in the École des Beaux-Arts, as well as some of the pupils in architecture, have presented a gold medal to M. Ginain, the professor of architecture, to celebrate the fiftieth year since his admission into the École.——The death is announced, at Paris, of Mdme. Calamatta, *née* Houdon, a talented painter, widow of the celebrated engraver Calamatta.

GERMANY.—Berlin is to have its special technical school for women. According to the plans now before the authorities the managing committee will be made up of lady members, and the curatorship will likewise be put in the hands of a lady. The instructors will, however, at first probably have to be recruited from the other sex.——The average tombstone in the German cemeteries is, as a rule, an eyesore. The Hamburg Arts and Crafts Society has now opened a competition for designs for tombstones of the simplest kind, the cost of which is to range between 15*l*. and 30*l*.——The competition for the sculptural decorations of the new theatre at Wiesbaden has been decided in favour of a design by Professor Volz, of Carlsruhe.——The Bavarian Government has given Messrs. Thiersch and Hauberrisser, the two leading architects of Munich, some valuable decorations in appreciation of their services in the National Museum Competition.—— Stettin, on the Baltic, is to have some extensive public sea-baths at a cost of over 10,000*l*. A competition for the design has been opened, with premiums ranging from 50*l*. to 150*l*.——The Vice-Mayor of Berlin, Herr Duncker, has died in his seventy-seventh year, after having served some thirty years in the Common Council. He was intimately associated with the management of nearly all the more important improvements of his city. ——There is to be an exhibition of American woodcuts at the Berlin National Gallery. The "Society of American Wood-engravers," according to the Government *Gazette*, has decided to send over the complete exhibit which was shown at Chicago. A number of other contributions are expected.—— Cologne Cathedral, which did not receive a new organ at the time of its recent restoration, is now to have one with some 125 stops. Its dimensions will be about 11 mètres by 6 mètres, with 23 mètres height. The funds for it will be subscribed voluntarily.

BELGIUM.—The results of the excavations made by M. Louis Cavens at Mons are now exhibited at the Brussels Museum of Antiquities. The exhibit includes a number of interesting relics of the Belgo-Roman period.——According to the *Belgian News*, a company is being formed in Brussels for the purpose of purchasing the Hotel des Ventes, on the Boulevard Anspach, and transforming it into an Eden Theatre. If the project is carried out, as there appears every reason to believe that it will be, the works will be commenced at once, so that the opening may take place in May next, at the same time as that of the Antwerp Exhibition. The plans are already prepared, on the lines of the Empire Theatre in London. The direction of the artistic department will be entrusted to Sir Augustus Harris: so we read, but can this be true?

SWITZERLAND.—The international competition for a design of the proposed new Central Railway station at Lucerne has been decided. The first premium was not awarded, the second (3,000 fr.) fell to Herr Mössinger, of Frankfort, and the third to Professor Stier, of Hanover, both Germans.

MISCELLANEOUS.

SANITARY INSTITUTE EXAMINATION.—At an examination for Inspectors of Nuisances, held at Manchester on December 15th and 16th, forty candidates presented themselves. By permission of the Lord Mayor of Manchester the examination was held in the Town Hall. Written questions were set to be answered on December 15th, from 1 to 4 p.m., and the *viva voce* examination took place on December 16th, commencing at 9 a.m. The following fourteen candidates were certified to be competent, as regards their sanitary knowledge, to discharge the duties of Inspector of Nuisances:—John Brooke, Northwich; Eli Bryan, Liverpool; William Cook, Askam-in-Furness; Albert John Davies, Cardiff; Joseph Henry Fowles, Heywood, Lancashire; James Graham, Blackburn; Frank Higginson, Bolton; Jonathan P. Horsfield, Eccles; John Hutton, Kendal; Henry Livesey, Fulwood, Preston; Charles William Marks, Eccles; William John Reid, Belfast; John Terry, Bury; Thomas Waters, Ardwick, Manchester.

STAFFORD AND THE ELECTRIC LIGHT.—On the 13th inst. Colonel W. M. Ducat, R.E., on behalf of the Local Government Board, held an inquiry at the Guildhall, Stafford, concerning the application of the Town Council for sanction to borrow 20,000*l*. for the purposes of electric lighting, and 2,000 for purposes of extending the public baths. Dr. J. Hopkinson, who had been consulted by the Corporation, gave evidence in favour of the scheme being carried out. It is proposed to work the electric lighting apparatus in conjunction with the Gas Works, where the buildings for machinery, &c., would be erected. He thought that the scheme as at present suggested, which would embrace the centre of the town, would cost about 12,000*l*., but in view of the success of the scheme, which he thought certain, and the increased demands, it would be prudent to make provision at the outset for such extension.

INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting of the Institution of Civil Engineers, on the 19th inst.—Mr. Giles, President, in the chair—a communication was read treating the subject of "Hydraulic Power Supply in London," by Mr. E. B. Ellington, M.Inst.C.E. The paper first recorded the considerable progress made in the distribution of hydraulic power during the past five years—the number of machines worked from the system in London having risen from 609 in December, 1887, to 1,755 in December, 1892, and the length of mains laid from 27 to 58 miles in the same period, whilst the available horse-power had increased from 800 to 2,600. A public supply was now given in Liverpool, and works were in progress at Birmingham, Manchester, and several foreign towns. The first pumping-station in London, at Falcon Wharf, Blackfriars, was described by the author in a paper read before the Institution in 1887. Since that time other pumping-stations had been erected at Millbank, near the Houses of Parliament, and at Wapping, near the entrance to the London Docks, while a fourth station was in course of erection at City-road, near the Regent's Canal. The general arrangement of the latter stations was much the same as that at Falcon Wharf, except that at Wapping triple-expansion engines had been employed with a steam-pressure of 150 lbs. per square inch. The water used was obtained at Millbank from the gravel-bed overlying the London clay. Through this bed about 150 ft. of headings had been driven. The water contained iron, which was deposited on exposure to the air. For getting rid of this iron and filtering the water, the Porter-Clark lime-process was employed at a cost of 1·05d. per 1,000 gallons. The average output from the station was 1,500,000 gallons per week. The water at the Wapping pumping-station was obtained partly from the gravel-bed, as at Millbank, and partly from the London Dock. The quantity of iron in the water was much less than at Millbank, and the Pulsometer Company's "Torrent" charcoal filters were used at that station. For the purpose of clarification, "Alumino-Ferric" had been successfully employed. The capacity of the Wapping station was 800,000 gallons in 24 hours. The water used at the several stations was pumped into tanks situated over the engine and boiler-houses by pumps worked by hydraulic pressure. These pumps had proved to be economical machines and possessed the great advantage of being able to work by the pressure in the mains when the main engines and boilers were stopped during the night. The only station worked continuously was that at Falcon Wharf. The total capacity of the accumulators in connexion with the system was 1,600 gallons, while the capacity of the pumping-plant was 3,500 gallons per minute. This showed that the accumulators acted almost exclusively as regulators of the pressure and had little effect in respect of storage. Particulars were furnished of the actual cost of the supply of hydraulic energy for the years 1884 to 1892 under the headings (1) Station and Distribution Expenses; (2) Repairs; and (3) General Charges. In the result it appeared that the amount of the supply was unlikely to affect the working cost favourably to any substantial extent. The experience of the cost of supply in London showed that the total expenses had increased in direct ratio to the total output, added to a constant representing the minimum cost of working the undertaking irrespective of the output. There was no reason to believe that experience in relation to hydraulic supply in London was likely to differ materially from that of other undertakings established for supplying energy in towns from artificial sources. If works were planned on a moderate scale in relation to the probable output and would allow of extensions as required, the minimum cost of supply would be approximated to within a comparatively short period, and further development was unlikely to exercise any material influence on the cost. The influence of capital expenditure on plant in relation to output was as important as the actual expense in determining the cost at which the consumer could obtain energy. The capital outlay for hydraulic supply in London had fallen from 2*l*·8 per 1,000 gallons in 1885 to 1*l*·24 in 1892, and a further reduction was anticipated in the future.

CHANGE OF ADDRESS.—Mr. Geo. D. Oliver, architect, Carlisle, has moved his offices to No. 5, Lowther-street, Carlisle, where all communications should be addressed in future.——Messrs. Gibson & Russell, architects, ask us to mention that on and after January 1 proximo, their offices will be removed to No. 11, Gray's-inn-square, W.C., where they request all communications to them may be addressed.

ASHTON-UNDER-LYME.—The parish church of Ashton-under-Lyne has just received a large four-light window from the studios of Messrs. Mayer & Co., of Munich and London. The window is Perpendicular in style, with elaborate tracery, and the subject selected for representation is the Nativity.

LEGAL.

STEVENSON *v.* WARD.

THE case of Stevenson *v.* Ward & Humphrey came before Mr. Justice Grantham and a common jury on Monday, it being an action brought by Mr. William Stevenson, the secretary of the United Builders' Labourers' Union, against Mr. John Ward, the President of the Navvies', Bricklayers' Labourers', and General Labourers' Union, and Mr. A. Humphrey, the secretary of the Union, to recover damages for an alleged libel. The plaintiff's case was that the defendants had published a handbill in March, 1893, which imputed that he had, at the bidding of the Masters' Association, secretly signed an agreement with reference to the payment of labourers who had left their employment of their own accord, which deprived the whole of the labourers of London of a portion of the substantial benefits obtained in the previous June.

The handbill ran as follows:—

FEDERATED UNION. No. 5.

NAVVIES', BRICKLAYERS' LABOURERS,' AND GENERAL LABOURERS' UNION.

REGISTERED OFFICE.—1, Argyle-street, King's Cross, W.C.

TO THE LABOURERS IN THE LONDON BUILDING TRADE.

"Comrades,—We wish to direct your attention to the conduct of Mr. W. Stevenson, General Secretary of the United Builders' Labourers' Union, who, by signing the following agreement of the masters on March 3, 1893, has deprived the whole of the labourers of London of a portion of the substantial benefits obtained in June of last year. His action is the more remarkable for, at a meeting of the London Building Trades Federation, held in February of this year, he positively denied that he had or ever intended to sign such a disgraceful document. Yet a few days later he, at the bidding of the Masters' Association, secretly signed the document he had previously condemned without even consulting any of the important Labourers' Unions connected with the building trades.

The following is a copy of the agreement:—

"Proposed by Rider (builder), seconded by H. R. Taylor, O.B.S. Any workman desiring to leave work during the week shall be entitled to receive his wages at 5 p.m., as provided for by the Rules 5 and 7, subject to his having given the foreman notice before twelve noon.

"Notwithstanding the above arrangement, in the event of more than 10 per cent. of the workmen of each trade employed at the shop or job giving notice to leave during the week they shall not be entitled to receive their money until the usual time on the following Saturday."

Signatures of masters follow.

Signature of W. Stevenson on behalf of the labourers.

The first clause abolishes the one hour and substitutes five hours' notice. The second clause is to place the unions at a disadvantage in a contemplated strike.

(Signed) JOHN WARD, President.
A. HUMPHREY, General Sec."

The defendants pleaded privilege and justification.

Mr. Murphy, Q.C., and Mr. E. Morton appeared as counsel for the plaintiff, and Mr. Cock, Q.C., and Mr. W. M. Thompson for the defendants.

Mr. Murphy, in opening the plaintiff's case, said that in May, 1892, a strike was pending in the building trade, and notices were given by the bricklayers to terminate their engagements. A

conference of masters and men was held, with the result that certain rules were agreed to. While these rules specified the time at which workmen who were discharged by their employers were to be paid their wages, no special provision was made for the payment of the wages of those men who left their work of their own accord. In the following February there appeared in the *Builder* a paragraph stating that it had been decided that a workman leaving work of his own accord after having given one hour's notice was to be paid on the following Saturday with the other men. The plaintiff wrote to the Secretary of the Masters' Association pointing out that he had not given his consent to the contents of the paragraph published in the *Builder*, and on March 3 there was a further conference between the masters and the men to approve an additional rule with reference to the payment of workmen who left their employment of their own accord. At that conference the masters proposed that men leaving their work of their own accord should receive their money on the following Saturday; but the plaintiff opposed the proposal, and in the result it was agreed that any workman desiring to leave work during the week should be entitled to receive his wages at 5 p.m. on the day he gave notice, provided he gave formal notice before 12 noon. It was also agreed that in the event of more than 10 per cent. of the workmen of each trade employed at a shop or job giving notice to leave during the week they should not be entitled to receive their money until the usual time on the following Saturday. On March 24 the members of the plaintiff's Union held their annual meeting, and on that day the defendants issued a circular containing the alleged libel.

The plaintiff, examined by Mr. Morton, said that in May, 1892, there was the danger of a strike in the building trade, and the bricklayers had sent notices to the master builders saying that they intended to strike, and thereupon a conference took place between the master builders and the bricklayers. There had been also a conference early in May between certain Unions representing the labourers and others in the building trade. He attended the conference of the masters on June 10, and the printed report of what had taken place, and which was put in as evidence, was correct. There was no rule for time payments when a man discharged himself. He and some others called attention to that fact at the time of the conference, but they could not make any headway. In the *Builder* for February 11, 1893, there appeared the following paragraph:—

"3. The Council having empowered the Strike Committee to deal with any questions arising out of the interpretation of the new rules, they conferred with representatives of the Operative Bricklayers' Society, the Operative Stone Masons' Society, and the United Builders' Labourers' Union, and it was decided:—

'(*a*) A workman leaving work of his own accord, after having given one hour's notice, is to be paid on the following Saturday with the other men, but where a man shows reasonable cause for quitting his employment during the week, it is customary for him to receive a ticket for payment at the yard, but in this case no walking time is allowed.

(*b*) Banker masons at work in shops on jobs where there is artificial light, shall be subject to the sames rules as such men working at the builders' yard.'"

On February 17 there was a meeting held of the London Building Trades Federation, and at that meeting attention was called to what was stated in the *Builder* of February 11. The defendant Humphrey was there. He (witness) rose and stated that what he had seen in the *Builder* had taken him by the greatest surprise, and that he knew nothing at all about it, and had not been consulted on the question. He stated then that he should not agree to any arrangement by which a man was to give one hour's notice and then wait until Saturday for his money. He wrote to Mr. E. S. Henshaw, the secretary of the Master Builders' Association on the subject, and, on the 24th Mr. Henshaw replied, asking him (the witness) to attend a conference on March 3 to approve of an additional rule dealing with a workman leaving his employment of his own accord. He laid the letter before his executive society, and it was arranged that he should attend the conference, and he was given instructions as to what he was to do. The proposal made by the masters was that the men should wait until Saturday for their money. He (witness) opposed that with all the force of language he could produce at that meeting. He said that the same rule ought to apply whether the master discharged the man or the man discharged himself. The rule as finally proposed and passed at the conference held on March 3 was that a man was to receive his wages on the day he gave notice. The rule passed on March 3 was not the same rule as had been referred to in the *Builder* of February 11. On March 24 the annual meeting of his Society was held at the Lambeth Baths. At the meeting the operatives of the Society were elected. When the members of the Union came into the room a number of them had the defendants' leaflets in their hands. The rules which he signed on March 3 had not interfered with the rule which provided for a workman leaving of his own accord. He signed the agreement in the presence of everybody there, and not secretly.

Mr. A. Humphry, one of the defendants, said that the handbill in question was issued without his knowledge, and he never gave Mr. Ward authority to attach his name to it. He thought that the new rule which the plaintiff had signed had abolished the one-hour notice and compelled the labourers to give five hours' notice. He believed that its effect would be to place the unions at a disadvantage in a contemplated strike, and that the whole of the labourers of London would lose a portion of the substantial benefits which they had obtained in the previous June.

The Jury eventually returned a verdict for the plaintiff, and assessed the damages at 30*l*.

Judgment accordingly.

ANCIENT LIGHTS:

MR. JUSTICE ROMER ON EXPERT EVIDENCE.

THE case of the London Labourers' Dwellings Society, Limited, *v.* Hawkridge and others came before Mr. Justice Romer, in the Chancery Division, on Wednesday, the 20th inst., it being an action brought against the defendants by the plaintiffs, the freeholders of six houses, Nos. 24 to 29, both inclusive, in Watson's-place, Ware-street, Kingsland-road, N., for an injunction to restrain the defendants from erecting, or continuing to erect, on a piece of land fronting on Wilmer-gardens any buildings so as to obstruct or diminish the access of light to the plaintiff's ancient windows. There was also a claim for damages.

The plaintiff's case was that they had eighteen windows ancient lights on the ground floor, first floor, and second floor, and twelve staircase windows, all in the rear of the premises looking out into land in Wilmer-gardens, Kingsland-road, and six scullery windows looking westwards also ancient lights, and they alleged that the defendants were erecting a building in Wilmer-gardens which would, if not stopped, materially diminish light and air coming to their (the plaintiffs') windows.

The defence was a general denial of the allegations contained in the statement of claim.

Mr. Cozens Hardy, Q.C., M.P., and Mr. Norton appeared as counsel for the plaintiffs, and Mr. Neville, Q.C., M.P., and Mr. O. Leigh Clare for the defendants.

The expert evidence called on behalf of the plaintiffs was given by Messrs. Charles King Bidells, Ernest Augustus Runtz, Alexander Flemming, and William Froud Young, and that for the defendants by Messrs. Edw. Jas. Gadney, Henry Cully, and Thomas Batterbury.

His Lordship, in giving judgment, said that there was no doubt to his mind, after having heard the evidence, that there had been substantial injury to the plaintiffs' lights, and the only question was as to the amount. He had to try and settle that question as a jury would, and he assessed the damage at 240*l*., for which amount he gave judgment for the plaintiffs, with the costs of the action.

His Lordship, during the course of the case, called attention to the very serious discrepancies between the evidence of the plaintiffs' expert witnesses and that of the defendants'. The plaintiffs' witnesses stated that the damage done, in their opinion, to the plaintiffs' premises by reason of the alleged obstruction of light was between 400*l*. and 540*l*. On the other hand, the defendants' expert evidence was that there was no injury of any kind done to the plaintiffs' premises. His Lordship stated that he did not think that such a state of things was very creditable to the profession generally.

A BIRMINGHAM ARCHITECT'S APPEAL.

A CONSIDERED judgment was delivered on Tuesday, the 19th inst., in the Court of Appeal, consisting of Lord Justice Lindley, Lord Justice A. L. Smith, and Lord Justice Davey, in the case of Martin *v.* Price, it being the appeal of the plaintiff—a Birmingham architect—from the judgment of Mr. Justice Kekewich, who awarded him 120*l*. damages and the costs of the action, which he brought against the defendant for the infringement of his ancient lights. The plaintiff was the lessee of a house in Temple-street, Birmingham, for the unexpired term of twenty-nine years. The plaintiff did not occupy the house himself, but sub-let it to several persons. Some of the windows in the plaintiff's house were injured by the building which the defendant was proceeding to erect on the other side of the street. The defendant proposed to erect a building 25 ft. higher than the old house, and when part of the wall of the front building had been erected to 24 ft. 6 in. higher than the old building, the plaintiff commenced an action for an injunction to stop the defendant from erecting a house higher than the old one, so as to obstruct or injure his ancient lights, and the writ also asked for an inquiry as to damages. The motion by consent was treated as the trial of the action. Evidence was taken orally before the learned Judge, and on November 18 he gave judgment for the plaintiff for 120*l*. as liquidated damages and as compensation for the actual and forcible interference with his ancient lights according to the building plans of the defendant. The plaintiff thereupon appealed, his contention being that he was entitled to an injunction, and that the learned Judge had no jurisdiction to award damages in lieu of an injunction in respect of the injury he was likely to suffer if the defendant's building were taken to the contemplated height. On behalf of the defendant it was contended that the learned Judge (Mr. Justice Kekewich) had jurisdiction to do what he did.

Lord Justice Lindley, in giving judgment, said that the question as to whether the Court had jurisdiction to award damages by way of compensation for an injury not yet committed, but only threatened, was by no means free from difficulty. The question was one of very great importance. In his opinion the plaintiff was entitled to an injunction, and that the order appealed from must be discharged so far as it awarded damages only to the plaintiff, and in lieu thereof the order would be for an injunction to restrain the defendant from building higher than the old building above the level of the street. The costs as to the inquiry as to damages—which would probably be before an official referee—would be reserved.

The other Lords Justices concurring, the appeal was accordingly allowed with costs.

Mr. Warmington, Q.C., Mr. Renshaw, Q.C., and Mr. Mickram appeared as counsel for the appellant, and Mr. Jelf, Q.C., and Mr. Ingpen for the defendant.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

23,645.—MACHINERY FOR SAWING AND BORING TIMBER: *G. W. Pearce.*—The invention relates chiefly to machinery for sawing to length or width and boring holes for dowels. Two sets of apparati are used and two sets of boring machinery with a sliding table or support between them.

24,117.—SEATS FOR WATER-CLOSETS: *J. Parker.*—The seats which form the subject of this patent are made to slide in rails, and have a strengthening piece to prevent warping and to economise cost in manufacture.

357.—VENTILATOR OR CHIMNEY COWL: *W. J. Taylor.*—This invention consists of a series of cones with outside jackets of various shapes, acting as conductors and non-condensers of air and smoke, enabling the same to retain its warmth and tendency to rise until it has escaped from the shaft into the open air, rendering a down draught impossible.

1,471.—CLOSETS, SINKS, &c.: *S. T. Hellyer.*—According to this invention the basin proper and the lower portion of the trap is made in one piece, and the back portion in another, the interior of the base receiving the trap portion of the basin. The lower edge of the outside of the basin—that part which is level with the top of the base portion—is formed with a part which is supported by and overlaps the edge of the base. The lead trap is continued up outside the trap portion of the closet, and is turned over the upper part or edge of the base portion, so that when the basin is put in place, its overlapping part sits upon the lead turned over.

6,447.—COUPLING JOINT: *T. J. Davis.*—The joint, which forms the subject of this patent, is to be used for flexible tubing, and is automatic, *i.e.* "that the flow through the tap or valve must be shut off before the connexion can be broken, and the tap or valve must be open when the connexion is made." This is done by utilising two or more inclined planes upon the tap or valve in the form of wedges.

12,880.—MARBLE-LIKE PLASTER: *R. Baumann (Berlin).*—A composition for the production of plaster. The improved process consists in adding silicate of zinc to a mixture of gypsum and lime, whereby the plaster, which is prepared in the usual way, receives a marble-like lustre and appearance.

13,649.—ROOFING TILES: *J. H. Olsen and others.*—The tiles which are the subject of this patent are square and flat like slates, but one end is furnished with a rib, and two corners cut off. They are laid on the laths so that the sides form an angle of 45 deg. with the edge of the roof, the laths being laid at the same angle.

15,368.—STENCH TRAP: *J. Barnsley.*—According to this invention, an elongated opening is made either at the sides or underneath the trap, to clear out the refuse which may accumulate. The lid or cover for this has a groove to receive an indiarubber band, so as to make it watertight when fastened on by wing nuts or screws.

NEW APPLICATIONS FOR LETTERS PATENT.

DECEMBER 4.—23,233, A. and L. Poffley, Glass-glazing.—23,249, E. Halmshaw, Frames and Moulds for making Slag or Granite Bricks, Paviors' Tiles, &c.—23,278, H. Dickinson, Reversible Metallic Lathing and Machinery for producing same.—23,299, W. Eaves, Kilns for burning Bricks, Tiles, &c.

DECEMBER 5.—23,317, W. Bartholomew, Water-closets.—23,350, J. Beckett, Draught and Weather Excluder for Doors and Windows.—23,356, J. Brown and D. Simpson, Window Sashes.—23,365, E. Muntz and others, Adjusting Surveyors' Measuring Chains and Steel Tapes.—23,373, H. Burnet, Drain and Soil-testing Apparatus.—23,382, J. Pollock, Securing Windows, Casements, Doors, &c.—23,390, C. Jackson, Opening, Adjusting, and Closing Fanlights, Skylights, Trap Doors, &c.—23,404, W. Thompson, Preventing the Overflow of Water-closets.

DECEMBER 6.—23,446, A. and R. Knox, Mechanism for Adjusting the Table of Circular Saw Frames.—23,463, J. Corbett, Ratchet Brace or Attachment to same.—23,474, J. Cutting and H. Bennett, Cure for Smoky Chimneys and Down Draught.—23,485, A. Pearse, Window Fastener.—23,495, J. Bates, Kilns for Drying and Burning Bricks, Tiles, &c.—23,486, A. Pearse, Window Fittings.

DECEMBER 7.—23,522, E. Field, Chimney Top.—23,526, H. Bartlett, Waste-Preventing Cisterns and Syphons for Water-closets, &c.—23,536, J. Gordon, Windows.

DECEMBER 8.—23,608, T. Pennington, Weather Guard for the Bottom of Doors.—23,638, C. Sutcliffe, Tiles for Fireplaces, Hearths, &c.—23,661, C. Pattinson, Preventing Water-pipes Bursting.

DECEMBER 9.—23,729, J. Hay, Window Sashes.—23,748, M. and J. Lander, Fire-grates, Stoves, &c.—23,759, A. Wright, Covering Fire-proof Girders.—23,769, S. Smith, Builders' and Decorators' Extension Platform.

PROVISIONAL SPECIFICATIONS ACCEPTED.

20,720, J. Nixon, Automatic Window-catch or Fastener, applicable to Sliding Doors, Panels, Shutters, and Drawers.—21,012, P. Winn, Waste Fittings for Baths, Lavatories,

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Drainage Works, &c.	Woking Local Board	50*l.* 25*l.* 10*l.* and Four of 5*l.* each	Jan. 15'94
*Isolation Hospital	East Grinstead U.R.S.A.	5*l.* 5*s.*	Jan. 31
*Public Hall, Library, &c.	Kirkcaldy T.C.	50*l.* 30*l.* 20*l.*	Mar. 17
*Two New Fever Hospitals	Met. Asylums Board	200*l.* 150*l.* and 100*l.*	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Extension of Cemetery	Kilwinning (N.B.) Parochial Board	Mr. Armour	Dec. 26
Dwelling-houses, &c. Holburn-street, Aberdeen	G. N. of Scotland Ry. Co.	*Official*	do.
Sluice Valves	Bury (Lancs.) Corp.	do.	do.
Cast-iron Pipes (1,000 yards)	Rochdale Corp.	do.	Dec. 27
Model Lodging House, Drygate	Glasgow Impt. Trust.	do.	do.
Water Supply Works, Kirkyetholm	Kelso District Com.	do.	do.
High-level Road, Walls, &c. at Gasworks	Rochdale Corp.	T. B. Hall	do.
Road Works, Avon-road	Bournemouth Corp.	F. W. Lacey	do.
*Baths and Winter Gardens	Harrogate Corp.	Baggallay & Bristowe	Dec. 28
Six Dwelling-houses, Captain French-lane, Kendal	Mrs. Braithwaite	Jno. Stalker	Dec. 29
Enlarging the "Bakers' Arms," and Business Premises, Cwmcarn, near Abercarn	Phillips & Sons	G. Rosser	do.
Road Works, &c. Bridge-street	Alnwick & Canongate Local Board	G. Wilson	Jan. 1'94
*Isolation Ward Blocks, Wall, &c.	Toxteth Park Loc. Bd.	J. Price	Jan. 2
Stone Bridge, over River King, Walton	Cumberland C. C.	C. J. Bell	do.
Offices, Council House-street	Dover Town Council	*Official*	do.
*Erection of Offices	Bute Docks Co.	do.	Jan. 3
Kerbing, Channelling, Draining, &c. Pokesdown, near Bournemouth		Jas. Robinson	do.
Hospital Buildings	Felixstowe & Walton Local Board	G. S. Horton	do.
Sea Wall and Esplanade, Portishead	Bristol Corporation	J. P. Sturge & Sons	do.
*Removal of House Refuse	St. Marylebone Vestry	*Official*	Jan. 4
*Removal of Slop and Sweepings	do.	do.	do.
*Watering Streets and Roads	do.	do.	do.
Keeper's House, Gouthwaite	Bradford Corporation	do.	do.
Gasholder, &c.	Com. of Irish Lights	do.	Jan. 5
*Sewerage Works	Rhyl U.S.A.	B. Latham	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Cast-iron Pipes and Connexions	Leicester Corporation	A. Colson	Jan. 6
Street Works	New Swindon Loc. Bd.	H. J. Hamp	do.
Additions, &c. to School Buildings, near Southend	Great Stambridge Sch. Board	E. Wright	do.
*Works and Materials	St. George's, Hanover square	G. Livingstone	do.
*Making-up Roads, &c.	Ilford Local Board	*Official*	do.
*Engine and Pump Room	Woolwich Local Board	H. H. Church	Jan. 9
*Casual Wards	Poplar Union	W. A. Hills & Son	Jan. 10
Dock, Methil, N.B.	North British Ry Co.	Cunningham & Co.	do.
Road Metal	Tregony (Cornwall), Highway Board	J. Hocking	do.
Valves, Sluices, Ironwork, &c.	Glasgow Corp.	*Official*	Jan. 11
Public Baths, Kirkstall-road	Leeds Corporation	W. Hanstock	Jan. 15
*Sinking Well	Mansfield Corp.	G. Hodson	Jan. 16
Flint Road Metal	Amesbury (Wilts) U.R.S.A.	*Official*	do.
*Steel Pontoon and Alterations to Hammersmith Steamboat Pier	London County Council	do.	do.
Presbyterian Chapel, Barry, Glam.		T. G. Williams	Jan. 17
*Five Houses, &c. for Coast Guards, Felixstowe	Admiralty	*Official*	Jan. 19
*Asylum at Whitecroft near Newport	Isle of Wight County Council	B. S. Jacobs	Jan. 23
*School Buildings, Stratford	West Ham Sch. Bd.	Newman & Jacques	do.
*Boundary Walls, &c.	Carisbrooke Burial Bd.	W. C. Way	Jan. 29
Church Restoration, Caerwys, N. Wales		W. H. Spaull	Jan. 31
School Buildings, Albert-street, &c.	Nottingham Sch. Bd.	A. H. Goodall	No date
Four Shops and Houses, Greenough-street, Wigan		B. T. Johnson	do.
Shaft Sinking, Arley, Chorley, Lancs.	Blainscough Colliery Co.	*Official*	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Inspector of Nuisances	Stroud Local Board	100*l.*	Jan. 1'94
*Surveyor	St. Mary Stoke Newington Vestry	300*l.*	Jan. 5
*Temporary Assistant	South Gosforth L.B.		Jan. 6
*Surveyor	Beckenham Loc. Bd.	250*l.*	Jan. 7
*Clerk of Works	Colchester Sch. Bd.		No date

Those marked with an Asterisk (*) are advertised in this number. *Competitions, p.* iv. *Contracts, pp.* iv., vi. viii., *and* ix. *Public Appointments, pp.* xviii. *and* xx.

Sinks, &c.—21,101, P. Winn, Flushing Cisterns, &c.—21,136, J. Ricketts, Spirit Levels.—21,237, L. Hill and G. Mackie, Door Springs and Door-closing Apparatus.—21,300, J. Dunn, Gravity Button or Hasp for securing Cupboard or other Doors.—21,338, E. Breething, Machinery for Moulding Bricks.—21,508, W. Stevenson, Kiln fired from sides or top for Drying and Burning Bricks, Tiles, &c.—21,561,—T. Houghton, Sash Fastener.—22,103, A. Boult, Mortar, &c.—22,227, M. Williams, Cement Mortar.—22,250, T. Johnston, Cleaning Brush.—22,273, F. Rumball, Windows with Reversible Sashes.—22,275, E. Morgan, Chimney Flues.—22,278, F. Pilcher, Construction and Laying Down of Wood Block Roadways.—22,303, J. Jacobs, Coin-released Locks for Closet Doors.—22,457, P. Winderbank, Draught Excluder for Doors.—22,489, R. Robinson, Brick-cutting Tables.—22,505, A. Page, Sawing Machines.—22,531, A. Clark, Mechanism for Moving or Adjusting Skylights, Fanlights, Windows, &c.—22,623, J. Hewitt, Glazier's Wheel Glass-cutters.—22,696, J. Mitchell and W. Morrison, Stoves, Register Grates, and Cooking Ranges.—22,924, T. Hulls, Silent Draught-preventing Rolling Doors.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

22,687, D. Wimbush, an Extensible and Adjustable Scaffold for Building, House Painting, &c.—22,784, J. Gaskell and W. Robinson, Artificial Stone, Bricks, Tiles, &c.—21,172, J. Wilson, Joiner's Cramp.—21,274, G. Law, un., Ventilating Device for Sewers.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

DECEMBER 5.—By *W. Bradly* (at Deptford): 13, 14, Whitworth.st., Greenwich, u.t. 25 yrs., g.r. 2*l.* 15*s.* 3*d.*, 230*l.*; 1, Clarence-st., u.t. 31 yrs., g.r. 9*l.*, r. 35*l.*, 100*l.*; 35, King William-st., u.t. 31 yrs., g.r. 6*l.*, 115*l.*; 52, 58, Church-st., u.t. 31 yrs., g.r. 3*l.* 10*s.*, 125*l.*

DECEMBER 11.—By *A. Richards:* 4, Caversham-rd., Kentish Town, u.t. 54 yrs., g.r. 12*l.*, r. 53*l.*, 410*l.*; 190, 192, Weedington-rd., u.t. 63 yrs., g.r. 12*l.* 12*s.*, 275*l.*—By *Ball, Norris & Hadley:* No. 6, Camden.sq., u.t. 51 yrs., g.r. 10*l.*, 85*o.l.*—By *G. A. Wilkinson & Son:* f.g.r. of 120*l.*, Sandlands-rd., Fulham, reversion in 89 yrs., 2,260*l.*; f.g.r. of 24*l.*, Victoria-rd., reversion in 91 yrs., 490*l.*; f.g.r. of 24*l.*, Bullow-rd., reversion in 89 yrs., 485*l.*; f.g.r. of 30*l.*, Bagley's Lane, reversion in 91 yrs., 535*l.*; f.g.r. of 5*l.*, Elizabeth-ter., Peckham, reversion in 89 yrs., 100*l.*; f.g.r. of 154*l.* 14*s.*, Clever-rd., Victoria Docks, reversion in 88 yrs., 2,912*l.*; f.g.r. of 20*l.*, Arthur-ter., Leyton, reversion in 86 yrs., 405*l.*; f.g.r. of 20*l.*, High-rd., Leyton, reversion in 86 yrs., 365*l.*; f.g.r. of 30*l.*, Arthur-cottages, reversion in 87 yrs., 540*l.*; f.g.r. of 30*l.*, Glover's-cottages, reversion in 87 yrs. 540*l.*; f.g.r. of 56*l.*, King-st., Walthamstow, reversion n 89 yrs., 970*l.*: f.g.r. of 72*l.*, Bedford-ter., Finchley, reversion in 88 yrs., 1,245*l.*; f.g.r. of 16*l.* 16*s.*, Percy-ter., Harrow, reversion in 88 yrs., 280*l.*

DECEMBER 12.—By *Glover & Harrison:* 10, Chippenham-rd., Paddington, u.t. 70 yrs., g.r. 8*l.* 5*s.*, r. 50*l.*, 400*l.*—By *Driver & Perfect:* 5, Kersley-rd., Stoke Newington, u.t. 81 yrs., g.r. 6*l.*, r. 29*l.*, 280*l.*—By *Rogers, Chapman, & Thomas:* 46, Upper Manor-st., Chelsea, u.t. 8 yrs., g.r. 10*s.*, r. 32*l.*, 110*l.*

DECEMBER 13.—By *W. W. Jenkinson:* 1 to 9, Medcalf-pl., Pentonville, f., 1,840*l.*—By *Ireland & Barker:* 10, Charlotte-st., Fitzroy-sq., f., 1,000*l.*; the lease of 55, Charlotte-st., u.t. 12½ yrs., 100*l.*—By *Hobson, Richards & Co.:* 4 to 12 (even), Seagrave-rd., Fulham, u.t. 58 yrs., g.r. 35*l.*, 640*l.*; 5, 6, Roxby-pl., u.t. 58 yrs., g.r. 15*l.*, 220*l.*—By *R. Tidey & Son:* 34, 38, 40, and 42, Knoll-rd., Wandsworth, u.t. 92 yrs., g.r. 28*l.*, r. 128*l.*, 1,050*l.*—By *T. N. Turner:* F.g.r. of 9*l.* 9*s.*, Albion-st., King's Cross, reversion in 58 yrs., 225*l.*; f.g.r. of 44*l.*, reversion in 49 yrs., 910*l.*—By *F. Jolly & Co.:* 28, Tustin-st., Old Kent-rd., f., r. 28*l.*, 280*l.*

DECEMBER 14.—By *H. J. Bliss & Sons:* 134, Grove-rd., Victoria Park, u.t. 34 yrs., g.r. 4*l.*, r. 34*l.*, 385*l.*; 78 to 84 (even), James-st., Bethnal Green, u.t. 43 yrs., g.r. 9*l.* 15*s.*, 440*l.*—By *Slate & Butler:* 152, Avenue-rd., Acton, f., 1,600*l.*—By *J. A. Jones:* 27, Claverton-st., Belgravia, u.t. 40 yrs., g.r. 10*l.*, r. 65*l.*, 400*l.*—By *P. Hodson:* 16, 17, 18, Grove-st., Edgware-rd., u.t. 40 yrs., g.r. 18*l.*, r. 78*l.*, 565*l.*; 19, Northumberland-pl., Bayswater, u.t. 52 yrs., g.r. 6*l.*, r. 45*l.*, 345*l.*; 28, Bomore-rd., Notting Hill, u.t. 62 yrs., g.r. 4*l.* 10*s.*, 150*l.*, 30, 32, Bomore-rd., u.t. 64 yrs., g.r. 9*l.*, 355*l.*—By *Stimson & Sons:* Nos. 50, 52, Clapham-rd., f., r. 100*l.*, 1,630*l.*; 57, Bromfelde-rd., u.t. 68 yrs., g.r. 9*l.* 9*s.*, r. 50*l.*, 465*l.*; 7, The Grove, f., r. 60*l.*, 800*l.*; 118, High-st., Homerton, u t. 76 yrs., g.r. 7*l.*, r. 39*l.*, 150*l.*; 96, Effra Parade, Brixton, f., 280*l.*; 98, 100, Effra Parade, u.t. 68 yrs., g.r. 7*l.*, 375*l.*; 160, Boyson-rd., Walworth, u.t. 58 yrs., g.r. 6*l.* 10*s.*, r. 36*l.*, 350*l.*—By *C. C. & T. Moore:* 21, Prince's-st., Spitalfields, f., r. 95*l.*, 1,390*l.*; "Retreat Villa," Canewdon-rd., Southend, f., and plot of land, 560*l.*; 12, 14, 16, Buross-st., Commercial-rd., E., u.t. 23 yrs., g.r. 8*l.* 5*s.*, 355*l.*; 59, 61, Pekin-st., Poplar, f., 470*l.*; 25, 27, 31, 33, Hawksley-rd., Stoke Newington, u.t. 80 yrs., g.r. 25*l.* 4*s.*, r. 112*l.*, 820*l.*; 70, Cranmer-rd., Forest Gate, f., r. 25*l.*, 370*l.*; 29 to 39 (odd) Ireton-st., Bow, u.t. 80 yrs., g.r. 12*l.*, 630*l.*—By *Newbon & Co.:* 22, Wellington-sq., Chelsea, u.t. 36 yrs., g.r. 5*l.*, r. 40*l.*, 205*l.*; 2 to 12 (even), Glebe-rd., Bromley, u.t. 75 yrs., g.r. 60*l.*, r. 158*l.*, 950*l.*; 1 to 8, Florence-rd., u.t. 75 yrs., g.r. 52*l.*, r. 208*l.*, 1,210*l.*; 1, Thornhill Bridge-pl., Caledonian-rd., u.t. 38 yrs., g.r. 7*l.*, r. 30*l.*, 200*l.*; i.g.r. of 12*l.*, Ricardo-st., Poplar, u.t. 35 yrs., g.r. 5*l.*, 65*l.*

DECEMBER 15.—By *Jones, Lang, & Co.:* No. 4, Aldermanbury, two one-sixth shares, f., r. 92*l.* 3*s.* 4*d.*, 1,830*l.*—By *G. Trollope & Sons:* Two f. cottages, Great Missenden, Bucks, 290*l.*—By *Moss & Jameson:* 4, Cavendish-rd., St. John's Wood, u.t. 27 yrs., g.r. 15*l.*, r. 100*l.*, 900*l.*

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street.; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.

Greenheart, B.G.	ton	9/0/0 0/0/0
Teak, E.I.	load	5/10/0 15/10/0
Sequoia, U.S.ft.cu		2/3 2/6
Ash, Canada load		2/10/0 3/15/0
Birch, do,		2/10/0 3 10 0
Elm, do.		3 5 0 4 10 0
Fir, Dantsic, &c.		1 5/0 2 10 0
Oak, do.		2/15 0 5 0/0
Canada		5/10/0 7 0,0
Pine, Canada red		2/15/0 3 5/0
Do. Yellow		2 5/0 4 10 0
Lath, Dantsic, fath		4 10/0 5 10/0
St. Petersburg		5/0/0 6/10,0
Wainscot, Riga, &c., log		2/5/0 4/10 0
Odessa, crown		2/5/0 4 10 0
Deals, Finland		
2nd & 1st std	100	8 0/0 10/10/0
Do. 4th & 3rd		7 10 0 8 0/0
Do. Riga		7,10,0 9 0,0
St. Petersburg, 1st yellow		10 0/0 13/10/0
Do. 2nd yellow		8,0 0 9/0/0
Do. white		8 10/0 11/0 0
Swedish		8/0 0 16 0 0
White Sea		8 0 0 16 10/0
Canada, Pine 1st		22 10 0 29 10 0
Do. do. 2nd		17 0 0 18 10 0
Do. do. 3rd, &c.		7 10 0 10,10 0
Do. Spruce, 1st		9 0 0 11 0,0
Do. do. 3rd & 2nd		6'10'0 7'15/0
New Brunswick		6 0 0 7.5 0
Battens, all kinds		3 0,0 15 0,0
Flooring boards, sq. 1 in. prep. 1st		0'10'6 0 15 0
Do. 2nd		0 7 6 0 13/0
Other qualities—		0 5 3 0 7 0
Cedar, Cuba	ft.	/4 /4½
Honduras, &c.		/3½ /4½
Mahogany, Cuba		/3½ /6
St. Domingo, cargo av.		/3 1/6
Mexican do. do.		/3½ /4
Tobasco do. do.		/3½ /6
Honduras do.		/4 /5½
Rox, Turkey	ton	4 0 0 13/0/0
Rose, Rio		8 0 0 20/0,0
Bahia		7/c/0 18,0/0
Satin, St. Domingo		0 0/6 0'1 3
Satin, Porto Rico		c/0/7 c/1/6
Walnut, Italian		c/c/3½ 0/0/7

METALS.

Iron—Pig, in Scotland	ton.	2/3/9 0/c/0
Bar, Welsh, in London		5/17/6 6/c/0
Do. do. at works in Wales		5/7/6 5/11/0
Do. Staffordshire, in London		6/c/0 6/10/0
COPPER—British cake and ingot		46/0/0 46/17/1
Best selected		47½/10/0 47/0/0
Sheets, strong		54/c/0 0/0/0
Chili bars		43/2/6 43/7/0
YELLOW METAL	lb	0/0/4½ 0/0/5
LEAD—Pig, Spanish	ton	9/1c/0 9/11/3
English com. brands		9/12/6 9/15/0
Sheet, English, 6 lbs. per sq. ft. and upwards		11/c/0 c/ /0
Pipe		11/1c/0 0/0/0
ZINC—English sheet	ton	20/15/0 0/0/0
Vieille Montagne		21/5/0 0/0/0
TIN—Straits		75/10/0 76/0/0
Australian		75/17/6 76/7/6
English Ingots		80/10/0 81/0/0
Banca		79/10/0 80/0/0
Billiton		76/10/0 77/0/0

OILS.

Linsed	ton	19/17/6 20/2/6
Cocoanut, Cochin		34/10/0 0/0/0
Do. Ceylon		26 0/0 0 0,0
Palm, Lagos		26 0,0 0/0/0
Rapeseed, English pale		23'0'0 23 5 0
Do. brown		21/5 0 21 10 0
Cottonseed ref.		20 10.0 22 10/0
Oleine		22 0 0 24/0 0
Lubricating, U.S.		4 0/0 5 0 0
Do. refined		5/0/0 12 0 0
TAR—Stockholm	barrel	0'18 6 0/0/0
Archangel		0 12.6 0 0,0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.*]

BARNSLEY.—For the erection of boundary walls, kerbing, channelling, &c., at the Hoyland Common Schools, for the Hoyland Nether School Board. Mr. Walter J. Sykes, architect, Hoyland Nether, Barnsley:—
Mark A. Hague, Hoyland Common, near Barnsley £217 12 6

BETCHWORTH (Surrey).—Accepted for sanitary and hot-water work to Broome Park, Betchworth, for Gen. the Hon. Sir Percy Feilding. Mr. G. S. Finlay, architect, 10, John-street, Adelphi, London:—
Matthew Brodie, 2, Willow-street, Westminster £908 18 0

BOLTON.—Accepted for the execution of drainage works in several streets—Contracts No. 633 and 634, for the Town Council. Mr. W. H. Brockbank, Borough Surveyor, Town Hall, Bolton. *Contract No. 632.*—Taking up present rubble drains and relaying with earthenware socket drain pipes in Garden-street, Bury-street, Bullock-street, Barlow-street, Back Green-street South, Smith-street, Bare-street, and Folds. James Hope, Beckett-street, Bolton, at per schedule of prices. *Contract No. 633*—Taking up present rubble drains and relaying with earthenware socket drain pipes in Dawson-lane, Back Bow-street, Bark-street, Croasdale-street, St. Helena-road, Dale-street, Clarence-street, Falcon-street, Bath-street, Back Bridge-street, All Saints-street, and Edmund-street. Thomas Kilburn, 46, Arrowsmith-terrace, Bolton, at per schedule of prices. *Contract No. 634.*—Excavating, forming, and ballasting, in Back Haydn-street. David Holt, 14, Curtis-street, Horwich, at per schedule of prices. For the erection of an iron foot-bridge and abutment walls over the railway at Back o' th' Bank. Phillips & Co., Wigan,

BOURNEMOUTH.—Accepted for making up the following roads—Durnford-road, Malmesbury-gardens (remaining portion), and Alexander-road. Mr. F. W. Lacey, Borough Engineer and Surveyor :—

G. Troke £334 6 7

[Surveyor's estimate, £400.]

BOURNEMOUTH.—Accepted for making up the following roads—Langton-road, Gladstone-road (East), Carysfort-road, Hamilton-road (Boscombe), No. 2 Road over railway bridge (from Lansdowne-road to Wellington-road). Mr. F. W. Lacey, Borough Engineer and Surveyor :—

G. Troke £586 0 3½

[Surveyor's estimate, £618.]

BOURNEMOUTH.—For tar-paving the paths in the following roads :—(*a*) Langton-road, Gladstone-road (East), Carysfort-road, Hamilton-road (Boscombe), No. 2 road over Railway Bridge, from Landsdowne-road to Wellington-road); (*b*) Durnford-road, Malmesbury Gardens (remaining portion), Alexandra-road. Mr. F. W. Lacey, Borough Engineer and Surveyor :—

	a.	*b.*
North of England Asphaltic Company	£448 10 9	£351 4 9
Josiah Smart	330 6 0	253 13 4
Asphaltic Limestone Concrete Company, Limited*	304 0 6	237 3 2
[Surveyor's Estimate	320 0 0	243 0 6.]

* Accepted.

ARTFORD.—For the erection of additional school buildings, St. Alban's-road, for the Dartford School Board. Mr. G. H. Tait, M.Inst.C.E., architect, Lowfield-street, Dartford. Quantities by Mr. George Francis, Buckhurst Hill, London :—

Rochelle, Gover, & Smith	£2,987	Maxwell Bros.	£2,459
Co-operative Builders	2,650	R. Avard	2,373
T. Knight	2,559	J. G. Naylar & Son, Rochester (accepted)	2,372
Somerford & Jones	2,492		
Multon & Wallis	2,479		

DOVER.—For the construction of courts and passages, Clarendon estate, for the Town Council :—

H. Richardson	£360 0 0	Herbert Stiff	£280 10 0
W. Bromley	307 0 0	J. J. Hall, Dover*	208 13 6

* Accepted.

ECCLES (Lancs.).—For paving, sewering, and flagging Vicarage-grove, for the Corporation. Mr. A. C. Turley, C.E., Borough Surveyor, Town Hall, Eccles :—

Richard Lomax	£577 11 0	Robert Lomax, Barton-lane, Eccles*	£510 15 4
Caldwell & Balfe	575 13 2	Johnson Brothers & Smith	509 1 10
W. Winnard	532 6 9		
Prescott & Jones	526 18 2		
W. Snape & Sons	£514 17 6		

* Accepted.

[Borough Surveyor's estimate, £645 1 0.]

ECCLES (Lancs.).—For the construction of a 15-in. pipe-sewer, manholes, &c., Canal Bank, Monton, for the Corporation. Mr. Arthur C. Turley, C.E., Borough Surveyor, Town Hall, Eccles :—

Wm. Snape & Sons	£242 6 2	Robert Smith	£200 10 0
Wm. Vaughan	233 17 6	Robert Lomax	183 11 1
Richard Lomax	232 15 7	Caldwell & Balfe, Market street, Atherton*	175 4 5
Prescott & Jones	211 13 3		

* Accepted.

[Borough Surveyor's estimate, £220.]

GATESHEAD.—For paving and cementing four streets. Mr. J Bower, C.E., Borough Surveyor, Town Hall, Gateshead :—

Rodsley-avenue, paving.—J. J. & J. Robson, Newcastle £683 0 0

Rodsley-avenue, cementing pathways.—Thos. Rule, Jun., Gateshead 163 0 0

Herbert-terrace.—W. Cumming, Gateshead 371 0 0

Paving Back Exeter-street.—J. Wardlaw 325 0 0

HOVE (Sussex).—For the execution of sewerage works, Goldstone-street and Queen's-gardens, for the Commissioners. Mr. H. H. Scott, Town Surveyor, Town Hall, Hove :—

J. G. B. Marshall	£6,195 0 0	B. Cooke & Co.	£4,137 0 0
E. Isles	5,138 0 0	G. Bell	3,726 0 0
J. Longley & Co.	4,890 0 0	J. Parsons & Sons, Hove (accepted)	3,199 0 0
A. Kellett	4,251 15 0		
W. Meats	4,208 12 1		

HOVE (Sussex).—Accepted for the supply of hand-picked bill flints, for the Commissioners. Mr. H. H. Scott, Town Surveyor, Town Hall, Hove :—

T. Dudney, Portslade	500 yards at	£0	6 0
A. Hardwick (trustees), Hangleton	500 yards at	0	6 0
" "	250 yards at	0	5 0
W. Palmer, Hove	250 yards at	0	6 6
W. Hillman, Portslade	500 yards at	0	6 6

LEAMINGTON.—For rebuilding culvert, Milverton Brook, for the Corporation. Mr. De Normanville, Borough Engineer, Town Hall, Leamington :—

Jacob Biggs	£240	R. Fowen, Leamington*	£187

* Accepted.

LEDBURY (Herefordshire).—For sinking and steming (in brickwork) a well 30 ft. in depth, for the Rural Sanitary Authority. Mr. R. M. Bamford, architect, Hereford :—

H. Gammage	£166 19	J. Preece	£75 0
Timmings & Son	90 0	Turner	40 0

LONDON.—For constructing and refitting the offices in connexion with the Blundell-street School, Islington, and also for providing a partly new system of drainage, for the School Board for London. Mr. T. J. Bailey, Architect :—

C. Dearing & Son	£1,369	Stephens Bros.	£1,122
McCormick & Son	1,296	E. Houghton & Son, Stroud Green*	1,026
Hy. Knight & Son	1,165		

* Recommended for acceptance by the Works Committee.

LONDON.—For the enlargement of the Thornhill-road School by 400 places, and the provision on this site of a cookery centre, &c., for the School Board for London. Mr. T. J. Bailey, Architect :—

		For brickwork in cement, add
A. Reed & Son	£15,605 4 6	£139 2 6
Patman & Fotheringham	15,536 0 0	231 0 0
C. Cox	14,841 0 0	217 0 0
J. Allen & Son	14,426 0 0	143 0 0
E. Lawrance & Sons	14,228 0 0	220 0 0
H. Lovatt	14,016 0 0	193 0 0
Killby & Gayford	13,957 0 0	281 0 0
G. S. S. Williams & Son	13,924 0 0	260 0 0
John Grover & Sons	13,694 0 0	240 0 0
N. Lidstone, Blackstock-road, N.	13,780 0 0*	144 0 0*

* Recommended by the Works Committee for acceptance.

LONDON.—For a junior mixed school (to be built on arches), to provide accommodation for 414 children, in connexion with the Camden-street School, for the School Board for London. Mr. T. J. Bailey, Architect :—

		For brickwork in cement, add
T. L. Green	£9,524 0 0	£185 0 0
W. Grover & Son	9,327 0 0	160 0 0
G. S. S. Williams & Son	9,096 0 0	195 0 0
Treasure & Son	9,016 0 0	178 0 0
Allen & Sons	8,983 0 0	300 0 0
Killby & Gayford	8,936 0 0	159 0 0
J. & M. Patrick	8,899 0 0	238 0 0
H. Lovatt	8,715 0 0	202 0 0
C. Cox	8,573 0 0	163 0 0
E. Lawrance & Sons	8,550 0 0	200 0 0
W. M. Dabbs, Stamford Hill	8,259 0 0*	195 0 0*

* Recommended for acceptance by the Works Committee. The plans include the provision of one hall, a technical room, and a laundry centre.

LONDON.—For the enlargement of the Ilderton-road School by 364 places, and for other works, for the School Board for London. Mr. T. J. Bailey, Architect :—

		For brickwork in cement, add
J. Smith & Sons	£4,941 0 0	£85 0 0
B. E. Nightingale	4,713 0 0	89 0 0
Hart Bros.	4,600 0 0	104 0 0
Foster & Dicksee	4,559 0 0	70 0 0
Holliday & Greenwood	4,455 0 0	84 0 0
Kirk & Randall	4,380 0 0	87 0 0
E. Lawrance & Sons	4,264 0 0	78 0 0
W. Downs, Walworth-road, S.E.	4,177 0 0*	72 0 0*

* Recommended for acceptance by the Works Committee.

LONDON.—For providing low pressure hot-water apparatus, with the necessary boilers, at the school, now being erected in Ellerslie-road, for the School Board for London. Mr. T. J. Bailey, Architect :—

G. Davis	£620 0	J. Fraser & Son	£464 0
J. Gibbs & Son	573 0	W. Richardson & Co.	451 0
T. Braithwaite & Son	520 0	Wenham & Waters	443 0
T. Potter & Sons	518 0	J. C. & J. S. Ellis, Sheffield*	442 10
Z. D. Berry & Sons	502 10		
W. G. Cannon	481 10		

* Recommended by the Works Committee for acceptance.

LONDON.—For rebuilding the boys' and infants' offices in connexion with the Poole's Park School, Upper Holloway, and also for refitting the girls' offices and for providing a new system of drainage, for the School Board for London. Mr. T. J. Bailey, Architect :—

C. Cox	£1,207	Cowley & Drake	£1,150
G. S. S. Williams & Son	1,204	C. Dearing & Son	1,135
J. Grover & Son	1,194	Stevens Bros., Finsbury Park*	998
Davis Bros.	1,190		

* Recommended for acceptance by the Works Committee.

LONDON.—For providing and fixing low-pressure hot water apparatus in Enfield-road School, with the necessary boiler, for the School Board for London. Mr. T. J. Bailey, Architect :—

T. Green & Son	£504 0	J. Fraser & Son	£373 0
G. Davis	496 0	Purcell & Nobbs	373 0
Maguire & Son	456 10	Russell & Co. Berwick-street, W.*	358 10
J. & F. May	395 0		
R. Crane	395 0		

* Recommended for acceptance by the Works Committe.

LONDON.—For refitting the boys' and infants' water-closets at the Effra-parade School, Brixton, and for carrying out various drainage and sanitary works at the same time, for the School Board for London. Mr. T. J. Bailey, Architect :—

Snar & Son	£1,097	W. & H. Castle	£947
Davis Bros.	1,085	Hy. Mallett	938
Lathey Bros.	1,032	E. Triggs, Clapham*	915
J. Marsland	955		

* Recommended by the Works Committee for acceptance.

LONDON.—For the erection of a new Police-station, Judd-street, for the Receiver for the Metropolitan Police District. Mr. John Butler, Architect. Quantities by Mr. W. H. Thurgood :—

		Allowance for old materials.
Higgs & Hill	£9,999	£39
Perry & Co.	9,696	45
Hart Bros.	9,693	20
Dove Bros.	9,477	65
Scrivener & Co.	9,460	55
Grover & Son	9,417	53
Smith & Son	9,400	57
Ansell	9,380	60
Lathey Bros.	9,274	74
Killby & Gayford	9,098	50
Chessum & Sons	8,995	60
Lawrence & Son	8,889	30
Richardson	8,829	50

LONDON.—For making-up and paving King's-road (Sec. 3), and Brecon-road, for the Fulham Vestry. Mr. W. Sykes, New Streets Surveyor, Town Hall, Walham Green, London, S.W. :—

King's-road (Sec. 3).

	Roadway.	York.	Imperial.
Tomes & Wimpey	£66	£120	—
Nowell & Robson	80	139	—
Imperial Stone Co.	—	—	118

Brecon-road.

	Roadway.	York.	Adamant.	Victoria.	Imperial
	£	£	£	£	£
J. Hampson	—	140	—	—	—
E. Parry	225	—	—	—	—
H. J. Greenham	205	—	—	—	—
E. Rogers & Co.	257	155*	—	—	—
J. Alldred	286	134	—	102 10	107
G. Wimpey & Co.	240	140	100 10	—	—
Nowell & Robson	285	149	—	—	—
J. Mears	260	—	—	—	—
Imperial Stone Co.	—	—	—	—	110

* £143 if roadway tender accepted.

LONDON.—Accepted for the construction of 4,250 yds. pipe sewers, manholes, &c., for the Hendon Rural Sanitary Authority :—

A. T. Catley, Lloyd's-square, London £2,900 0 0

LONDON.—For the dusting of the Parish of Chiswick. Mr. Ramsden, Surveyor :—

	1st Year.	2nd Year.	3rd Year.
H. J. Greenham	£1,500	£1,550	£1,600
John Ball	1,400*	1,420*	1,440*

* Accepted.

LONDON.—For paving St. Aidan's-road, Peckham Rye, for the Camberwell Vestry. Mr. O. S. Brown, Surveyor, Vestry Hall, Peckham-road, London, S.E. Quantities by the Surveyor :—

Masons' and Road Work.

T. Adams	£711 17 3½	Mowlem & Co., Westminster (accepted)	609 13 10
A. T. Catley	660 0 0		
S. Hudson	633 11 5	Mayo & Co.	£595 3 10

Asphalte Work.

A. T. Catley	£356 2 9	Asphaltic Limestone Co., Queen Victoria-street (accepted)	£307 3 2
French Asphalte Co.	341 5 3		
Val de Travers	336 6 4		
Limmer Co.	316 10 8		

LONDON.—For the construction of a brick sewer 700 ft. in length, Lancaster-road, for the Vestry of St. Mary Abbotts, Kensington :—

Jno. Neave	£840 0 0	Mayo & Co.	£545 0 0
J. H. Newman	728 0 0	G. Wimpey & Co.	510 0 0
J. Jackson	579 19 4	J. Mears	490 0 0
T. Adams	561 0 0	E. Rogers & Co.*	473 0 0
Nowell & Robson	550 0 0		

* Accepted.

[Surveyor's estimate, £490.]

LONDON.—For proposed roads and sewers to be constructed on Langhedge Estate, White Hart Lane, Tottenham, for Mr. J. F. Swann. Mr. F. Child, F.S.I., 65 and 66, Chancery-lane, W.C., and Messrs. Reddall & Son, 10, South-street, Finsbury, E.C., surveyors :—

	Without granite kerbing.	With granite kerbing.
Jesse Jackson	£2,477 0 0	£3,167 0 0
Jas. Bloomfield	2,186 0 0	2,943 0 0
Thos. Adams	2,227 15 0	2,844 0 0
J. Pizzey	2,182 0 0	2,843 0 0
Wm. Nicholls	2,113 5 9	2,771 1 2
Geo. Bell (accepted)	1,779 0 0	2,491 0 0

LONDON.—For alterations, &c., at 87, Gresham-street, E.C., for the Golden Grain Bread Co. Mr. H. Huntly Gordon, architect, 123, Cannon-street :—

Colls & Co.	£1,635	J. Barker & Co.	£1,291
R. Eddie	1,374	F. & H. F. Higgs	1,205

LONDON.—For alterations, &c., at 76, Lower Thames-street, for the trustees of Mr. T. K. Debenham. Mr. Harvey Dyball, architect, 35, Bucklersbury :—

Mansfield & Sons	£447	R. Eddie	£348
Woodward & Co.	360	Hocking & Co.	312

MACCLESFIELD.—For alterations to workhouse hospital, for the Union Guardians :—

Bradburn	£329 0	E. A. Frith	£295 0
J. T. Moseley	299 10	E. & J. Moores	265 0
Exors. G. Roylance, Macclesfield (accepted)	297 0		

MELTON MOWBRAY.—For the erection of a girder footbridge, for the Local Board. Mr. E. Jeeves, Surveyor, Melton Mowbray :—

Eastwood, Swingler, & Co.	£191 1 1	Barry & Higham	£153 0 0
Goddard, Massey, & Warner	155 10 0	James Downham	145 11 0
Wm. Whitford & Co.	155 0 0	Somervail & Co.	134 12 0
		W. Richards & Son, Leicester (accepted)	133 19 8

NEWBURY.—For the construction of eleven miles of stoneware and iron-pipe sewers, &c., for the Town Council. Mr. Jno. Anstie, engineer, 17, Victoria-street, London, S.W. :—

J. Strachan	£17,156 0 0	George Osenton	£15,360 0 0
T. Adams	16,867 13 0	James Dickson	15,257 9 0
W. Gibson	16,769 0 0	E. & W. Isles	14,949 2 0
Lloyd & Powell	16,679 13 8	George Bell, Tottenham*	14,508 0 0
B. Cooke & Co.	15,796 0 0	William Cunliffe	12,975 10 0
John Neave	15,521 0 0		
A. Kellett	15,457 0 0		

* Accepted.

OAKENSHAW (Yorks.).—For the construction of 370 yds. storm overflow channel, sewage works, for the North Bierley Local Board. Mr. Perceval Ross, C.E., Engineer's Office, Wibsey :—

John Hirst & Son	£832 10 0	M. W. Walmsley & Co.	£699 0 0
Robert Naylor & Son	777 0 0	Henry Birkby & Son	555 0 0
Godfrey Pearson	740 0 0	Walsh & Robinson	518 0 0
M. Hall & Son	693 15 0	John Slinger	508 15 0
A. Brotup & Son	638 5 0	John Brigg, Bingley*	507 4 2

* Accepted.

OXFORD.—For the erection of farm buildings at the Corporation Sewage Farm, Sandford-on-Thames. Mr. W. H. White, City Engineer, Oxford :—

T. Robinson	£1,522 17 7	J. S. Kimberley	£1,083 0 0
W. Lambert & Co.	1,482 13 8	J. Wooldridge	1,078 10 0
J. Coppock	1,235 17 0	J. Smallwood & Co.	1,067 0 0
S. F. Halliday	1,213 0 0	Wilkins & Son	1,049 19 0
W. Rose	1,199 6 4	G. E. Tucker	1,004 8 11
G. Simons	1,124 18 9	T. Colborne	997 12 6
J. Parnell & Son	1,124 0 0	W. Polley	940 14 6
Wastie Bros.	1,096 1 10	C. H. Wheeler	900 0 0
T. Axtell, Junr.	1,095 9 10	W. H. Siarcy, Kingston, Tetsworth*	811 11 0
T. A. Groves	1,083 11 0		

[City Engineer's estimate ..... £940 0 0.]

* Accepted.

PONTYGWAITH (Wales).—For the erection of school buildings, for the Ystradyfodwg School Board. Mr. J. Rees, architect, Pentre :—

C. Jenkins & Son	£2,100 0 0
D. Jones	1,956 10 0

POOLE.—Accepted for the construction of several footways, &c., (5 contracts), for the Town Council. Mr. Jno. Elford, Borough Surveyor, King-street, Poole :—

Ashley-road.

E. Guy, Newtown, Poole £368 0 0

Bournemouth-road.

T. C. Rigler, Longfleet, Poole £119 0 0

Poole-road.

G. T. Budden, Newtown, Poole £28 17 0

Station-road.

C. Brixey, Newtown, Poole £31 10 0

Supplying 15 Lamp Standards, Lanterns complete :—

Bayley & Sons, Poole £62 0

PURLEY (Surrey).—For reconstructing the drains and sanitary arrangements of the Warehousemen, Clerks, and Drapers' Schools, and enlarging the girls' play-shed. Mr. J. Kingwell Cole, architect. Mr. Edward S. Mansergh, surveyor, 17, Hart-street, Bloomsbury-square. W.C. :—

Godfrey Giles & Co.	£3,200	Sanitation Co., Ltd. ...	£2,744
ohn Mowlem & Co.	3,083	North British Plumbing	
aird, Thompson, & Co.	3,055	Co.*	2,700

*Accepted.

QUEENSBURY (Yorks.).—For the construction of 10,600 lineal yards brick and earthenware pipe sewers, &c., for the Local Board of Queensbury, near Bradford. Mr. Jno. Drake, C.E., Winterbank, Queensbury :—

D. Brook & Sons ..	£18,864 0 0	S. & E. Bentley ..	£12,840 0 0
B. & T. H. Riley ..	15,919 11 3	D. Shanks	12,675 15 6
J. Moulson & Sons.	13,935 0 0	E. Kellett	12,590 0 0
R. Hopkinson	13,899 15 0	Garforth Bros.....	12,134 8 0
John Simpson	13,870 0 0	A. Bland	12,080 8 1
Wm. Small.....	12,940 0 0	E. Balmforth	11,838 16 4
G. & H. Tyson....	12,688 12 4	P. Drake	11,298 0 0
J. Charnock & Sons	12,865 0 0	Day & Hainsworth,	
M. Birkby & Sons..	12,853 15 1	Queensbury*	11,200 0 0

[Engineer's estimate, £12,150.]

* Accepted.

RADSTOCK.—For the construction of water works for the Radstock Local Board. Mr. T. Martin, Surveyor :—

Excavating, Masonry, and Brickwork.

	Including Tunnel.		Excluding Tunnel.
H. Shardlow	£5,524 3 7	..	£3,660 0 10
J. Bird	3,390 2 6	..	2,962 9 6
P. Ambrose.....	4,016 10 7	..	2,866 16 0
F. C. Caffin.....	3,733 8 4	..	2,755 4 7
A. Krauss	3,100 0 0	..	2,451 15 8
Lloyd & Powell	3,190 15 5	..	2,437 0 10

Pipe Laying and Fixing Meters, Valves, and Hydrants, &c.

Lloyd & Powell	£1,495 10 2	H. Shardlow	£879 7 6
C. Colston.....	1,478 19 3	D. F. Green.....	867 10 0
F. C. Caffin	1,243 14 9	Allen & Sons	754 15 2
P. Ambrose	1,079 8 6	J. Bird	740 0 0
A. Krauss	980 14 9		

Cast-Iron Pipes and Irregulars.

Shaw & Walker ..	£6,570 9 6	A. Krauss.....	4,070 0 0
The Wallsend Pon-		Silvesters.....	4,055 17 9
toon Co.	4,812 2 7	H. Shardlow	4,003 18 3
J. Shaw & Co.....	4,635 16 0	J. Bird	4,002 0 0
B. Y. Stewart &		The Stanton Iron	
Co.	4,506 17 0	Co.	3,842 15 1
Lloyd & Powell ..	4,383 10 0	The Staveley Iron	
Laidlaw & Son....	4,215 0 0	Co.	3,841 7 11
T. Spittle & Co. ..	4,085 8 5	J. S. Roberts & Co.	3,806 12 3
The Clay Cross		Cochrane & Co.....	3,783 17 3
Co.	4,079 6 0	C. Jordan & Sons..	3,779 0 0

Valves, Hydrants, Reservoir, and other Fittings.

Shaw & Walker*	£879 15 0	TheGlenfieldCompany,	£295 8 0
Alley & Maclellen....	421 0 6	Hamilton, Woods&Co.	279 0 0
Kirk & Horsfield*....	367 0 0	Beck & Co.	238 4 6
J. Stone & Co.	341 8 6	H. Shardlow	235 12 0
J. Tylor & Sons.....	331 4 3	J. Blakeborough &	
J. Bird*	305 0 0	Sons*	235 11 0
Lloyd & Powell*	303 3 0		

* Including pillar fountains.

For the Entire Works.

H. Shardlow.....	£8,778 18 7	J. Bird (subject to a	
Lloyd & Powell	8,619 4 0	deduction of £140)	£8,007 9 6

Accepted.

Contract I.—Mr. J. Bird, Radstock, including the delivery of cast-iron pipes from the railway-stations along the line of works £3,702 9 6

Contract III.—Messrs. Cochrane & Co., Dudley 3,783 17 3

Contract IV.—Messrs. J. Blakeborough & Sons, Brighouse, including pillar fountains, and 3-in. sluice valves, for hydrants and sheet watering posts 270 11 0

Surveyor's Estimate of Contracts I., II., III., and IV.. 7,830 0 0

Estimate for delivery of pipes along line of works..... 215 0 0

RISCA (Mon.).—For additions, &c., to school buildings, for the School Board. Mr. Geo. Rosser, architect, Victoria Buildings, Abercarn. Quantities by architect ;—

	Additions, &c.	Reslating.
C. H. Reed	£1,000 0 0	£66 12 6
A. Parfitt	895 0 0	60 0 0
Newby & Co.	889 1 9	53 6 0
J. Jenkins	888 0 0	38 10 0
J. Walker	869 15 9	55 0 0
Hy. Pritchard	780 10 9	50 0 0
Jno. Pritchard	740 0 0	45 0 0
T. Colborne	706 17 0	58 7 10
Davies Bros.....	697 14 0	04 11 6
Alldrige & Syrett, Newport....	625 0 0*	33 14 6*

* Accepted.

SEATON (Cumberland).—For the execution of sewerage works, Siddick, for the Cockermouth Union Rural Sanitary Authority. Mr. Wilson C.E., Court House-buildings, Cockermouth. Quantities by Engineer :—

R. Cousins	£725 14 6	J. G. Harrison	£512 0 0
R. Brown	719 6 0	S. McWhinney	472 1 6
J. Hunter	697 13 6	L. Ferguson	344 19 0
J. Taylor & Son..	693 12 0	Dixon & Nicholson,	
W. Barwise	617 18 0	Maryport*	335 13 0

* Accepted.

SOUTHAMPTON.—For the construction of a pavilion, Royal Pier, for the Southampton Harbour Board, from plans and specifications prepared by Mr. E. Cooper Poole, A.M.Inst.C.E. :—

G. Shillabear	£4,172	H. J. Sanders	£3,348
W. H. Lascelles & Co. ..	4,093	Roe & Grace, Southamp-	
Murdoch & Cameron	3,946	ton (accepted)	2,995

[Protecting estimate of engineer, £3,500 0 0.]

SOUTHEND-ON-SEA.—For covering east and west side of tramway platform on the pier, for the Pier Committee. Mr. C. T. Copley, Borough Surveyor, Clarence-road, Southend :—

Baker & Wisemans.....	£216 17	F. Dupont, Southend-on-	
		Sea (accepted)	£223 0

TAUNTON.—For the construction of the North Town Bridge, Taunton :—

	Mason.	Steelwork.	Total.
Pauline & Elliott	£2,180 0 0	£4,358 0 0	£6,538 0 0
Butler & Co.	2,515 7 0 ..	3,947 6 0 ..	6,402 13 0
Bond & Hitchcock ..	1,911 3 3 ..	3,960 0 9 ..	5,871 4 0
Finch & Co.....	2,045 6 3 ..	3,637 6 0 ..	5,682 12 3
Geo. Double	2,183 16 9 ..	3,452 17 0 ..	5,636 13 9
Gooding.....	— ..	— ..	5,500 0 0
Lysaght & Co.	— ..	3,529 0 0 ..	—
Phœnix Co.	— ..	3,912 14 8 ..	—
W. H. Pollard	— ..	.. ..	5,204 17 10

[Surveyor's estimate, £5,500.]

TREORKY (Wales).—For the erection of school buildings, for the Ystradyfodwg School Board. Mr. J. Rees, architect, Pentre :—

New Infants' Schools.

John Rees	£2,579 0 0
Alban Richards, Pentre*	2,400 0 0

Alterations of existing Schools.

Alban Richards.....	£1,700 0 0
John Rees, Ynysybwl*	1,560 0 0

* Accepted.

WHITEFIELD (Lancs.).—For the supply of 700 tons of 7-in. flag rock setts ; 760 yards second barns flags, 440 yards flag rock kerbs, for the Local Board. Mr. Wm. Skinner, Surveyor, Local Board Offices, Elms-street, Whitefield :—

	Delivered on the job.
J. Whittaker & Son, Shuttleworth..	£0 9 9 per ton setts.
" " ..	0 3 5 per yd. flags.
" " ..	0 2 9½ per yd. kerbs.

[11 firms tendered.]

WEDMORE (Somerset).—For the erection of school buildings and teachers' house, Theale, for the School Board. Mr. E. Wall, architect, Wedmore :—

Hatherley	£4,447 0	F. Merrick & Son	£2,398 0
Hawkins & Co.....	2,770 0	F. Hewish, Street, near	
Wall & Gibbs.....	2,766 0	Glastonbury*	2,150 0
J. Ford & Sons.....	2,550 10	* Accepted.	

WEST HAM.—For the erection of a block of school buildings, &c., Manor-road, Stratford, for the School Board, accommodating 1,580 children, including laundry, cookery room, manual instruction room, and caretaker's house. Messrs. J. T. Newman & Jacques, architects, 2, Fen-court, London, E.C. Quantities by Messrs. R. & L. Curtis & Sons :—

Longley & Co.	£23,190	Lorden & Son	£20,350
J. Holland	21,752	F. J. Coxhead	£20,095
Reed & Son	21,436	W. J. Maddison	19,250
Stimpson & Co.	20,880	Gregar & Son, Stratford*	19,130

* Acce pted subject to the approval of the Education Department.

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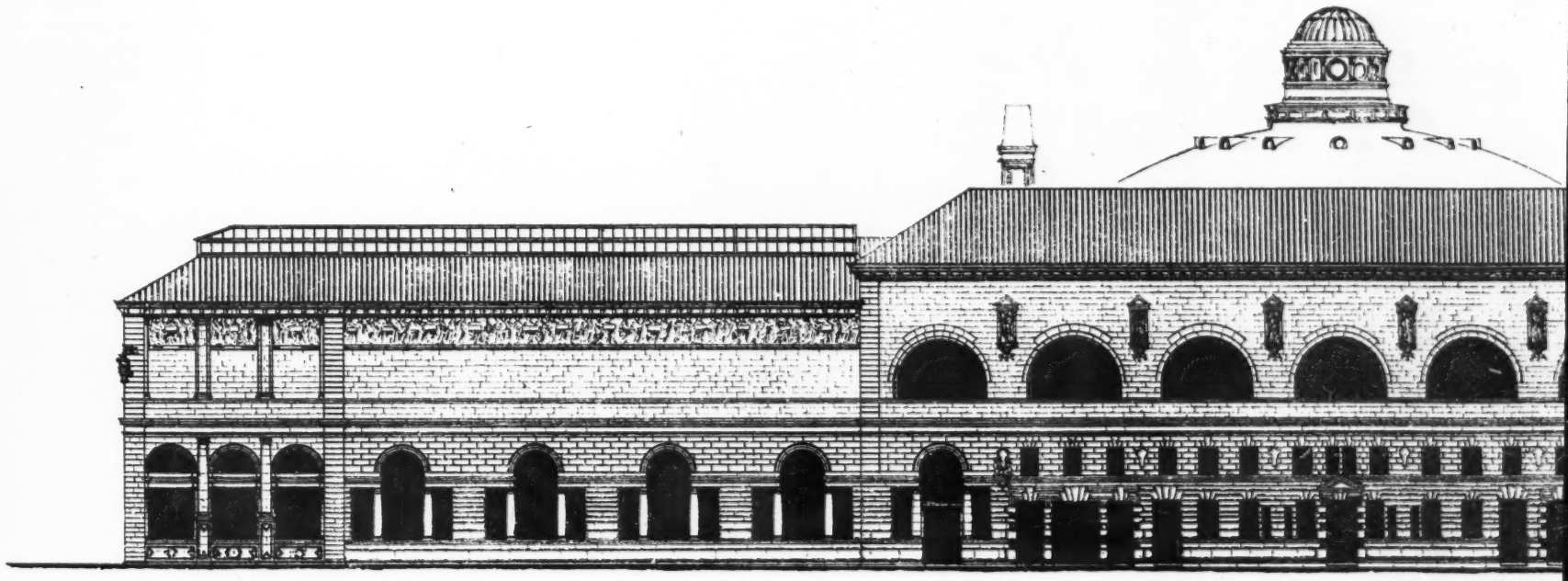

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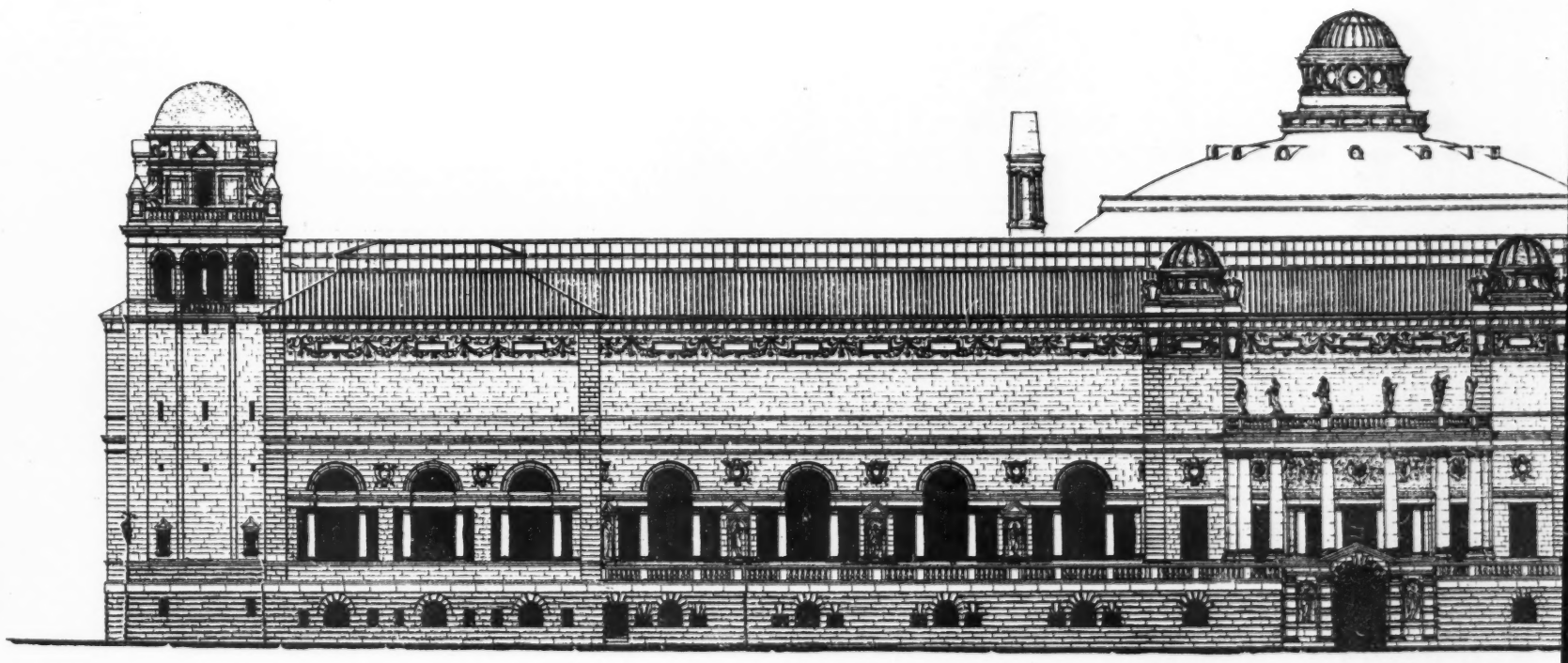

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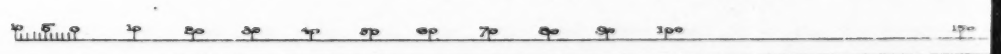

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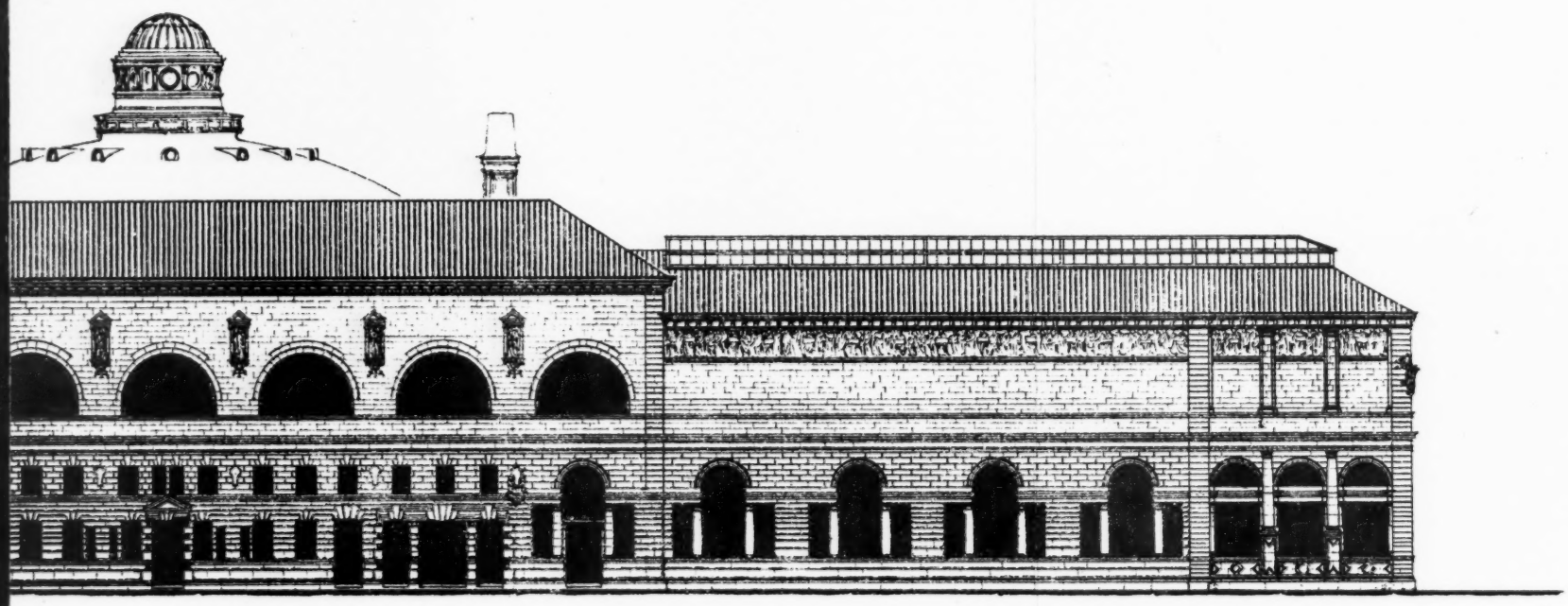

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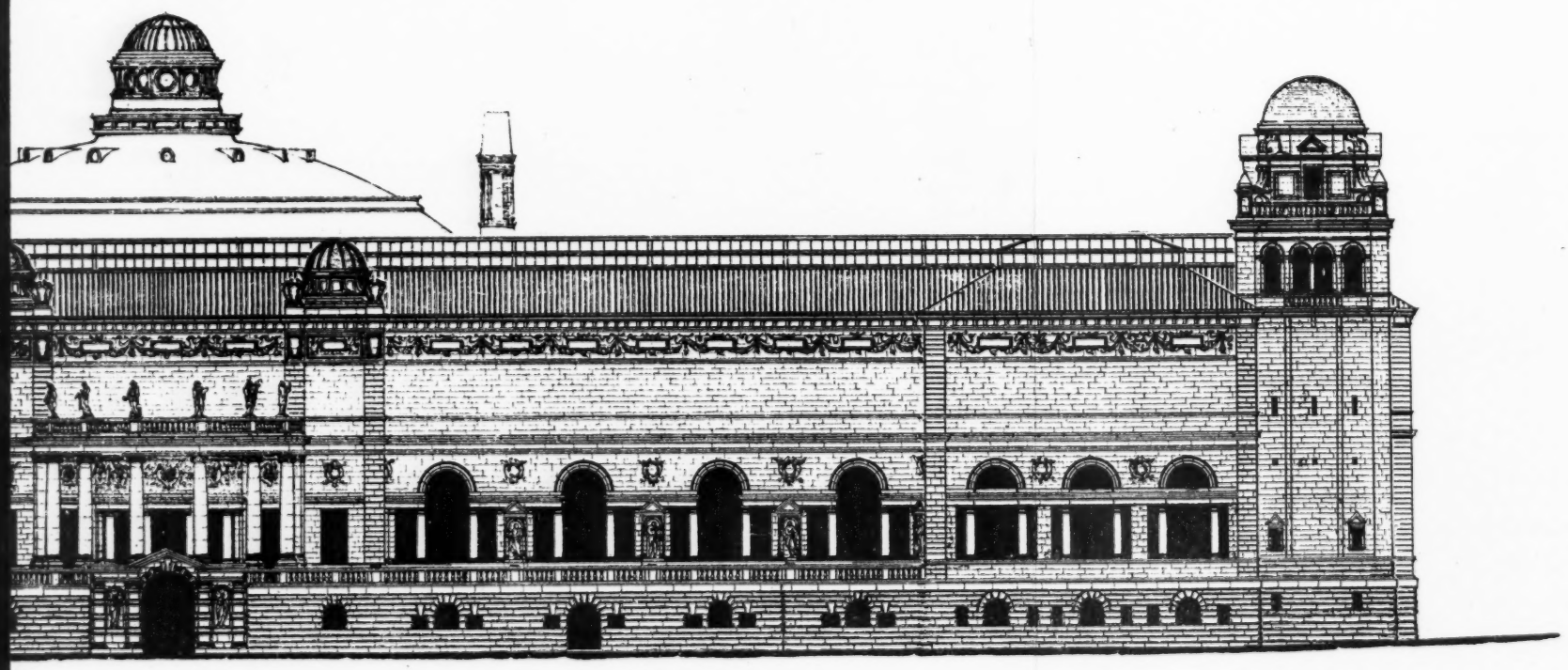

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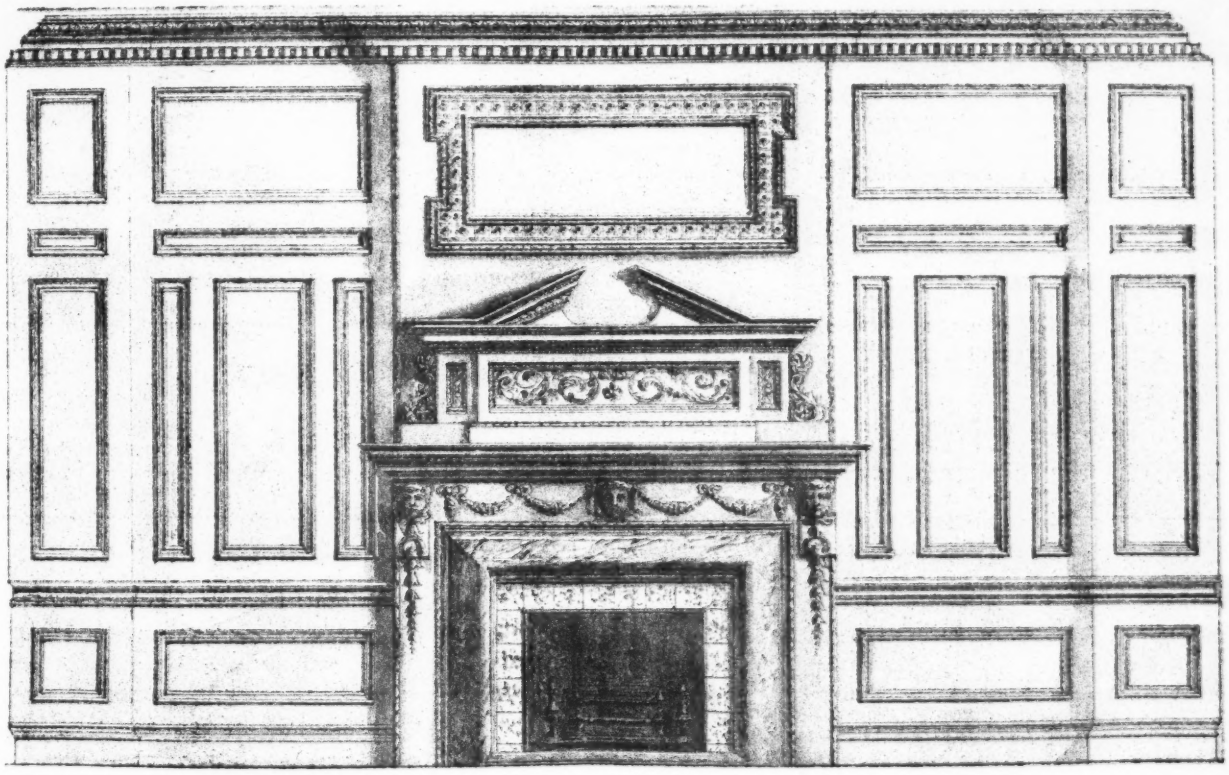

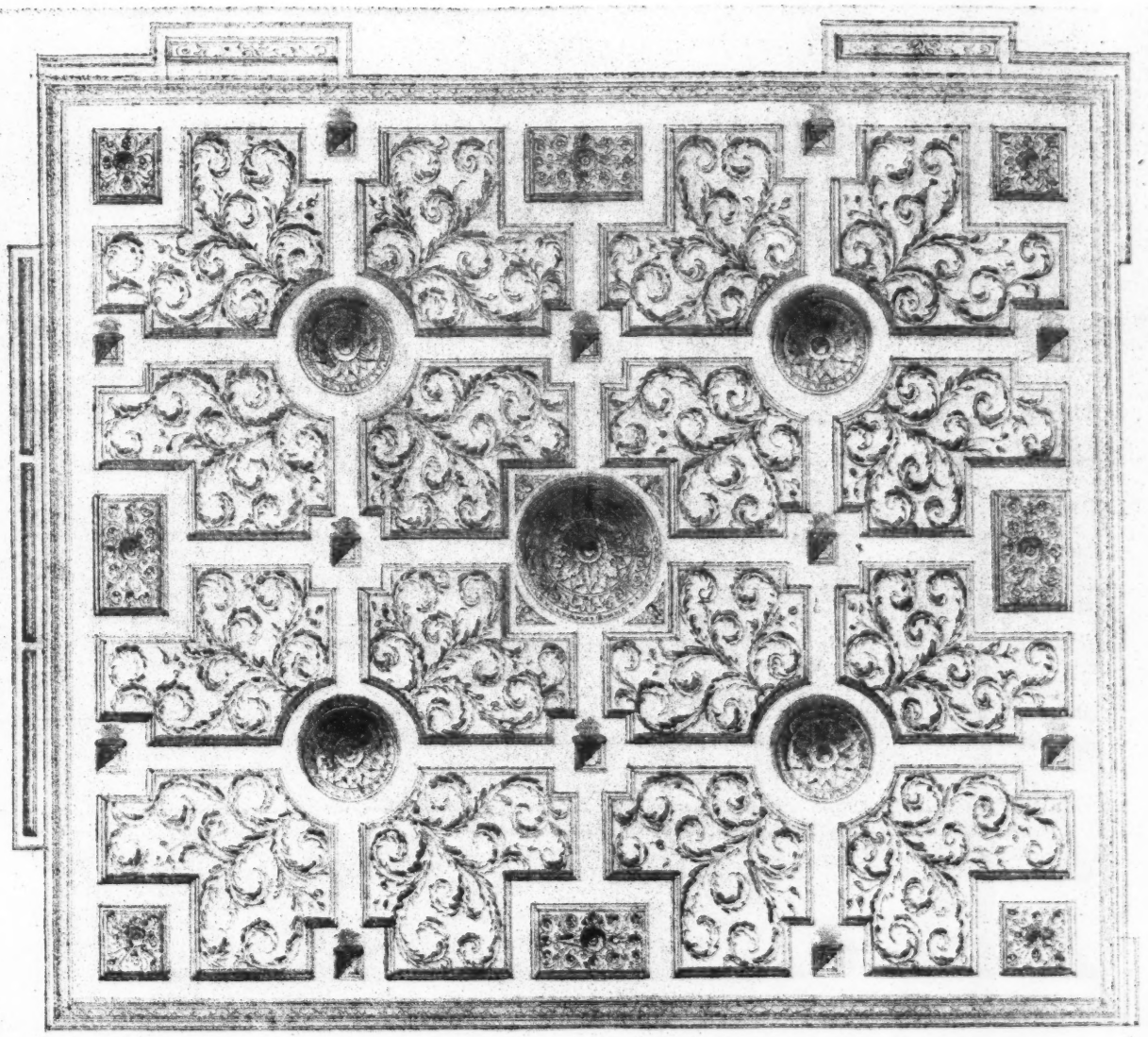

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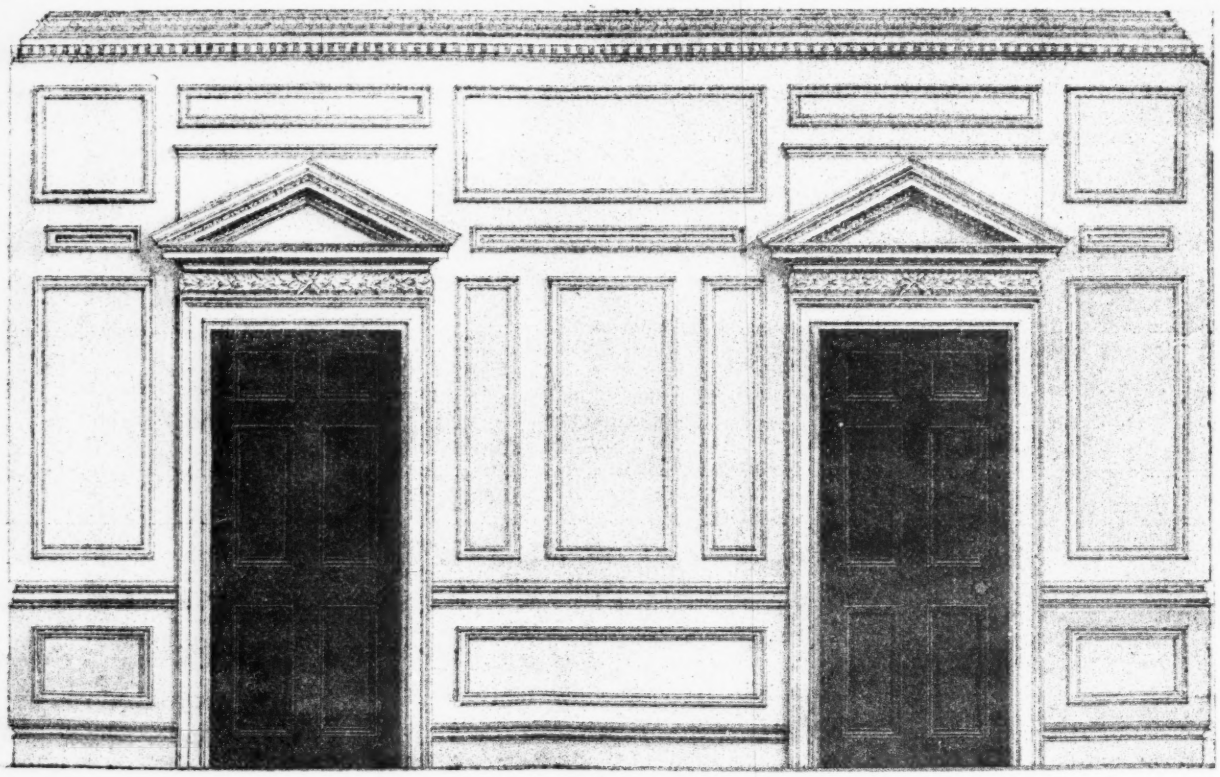

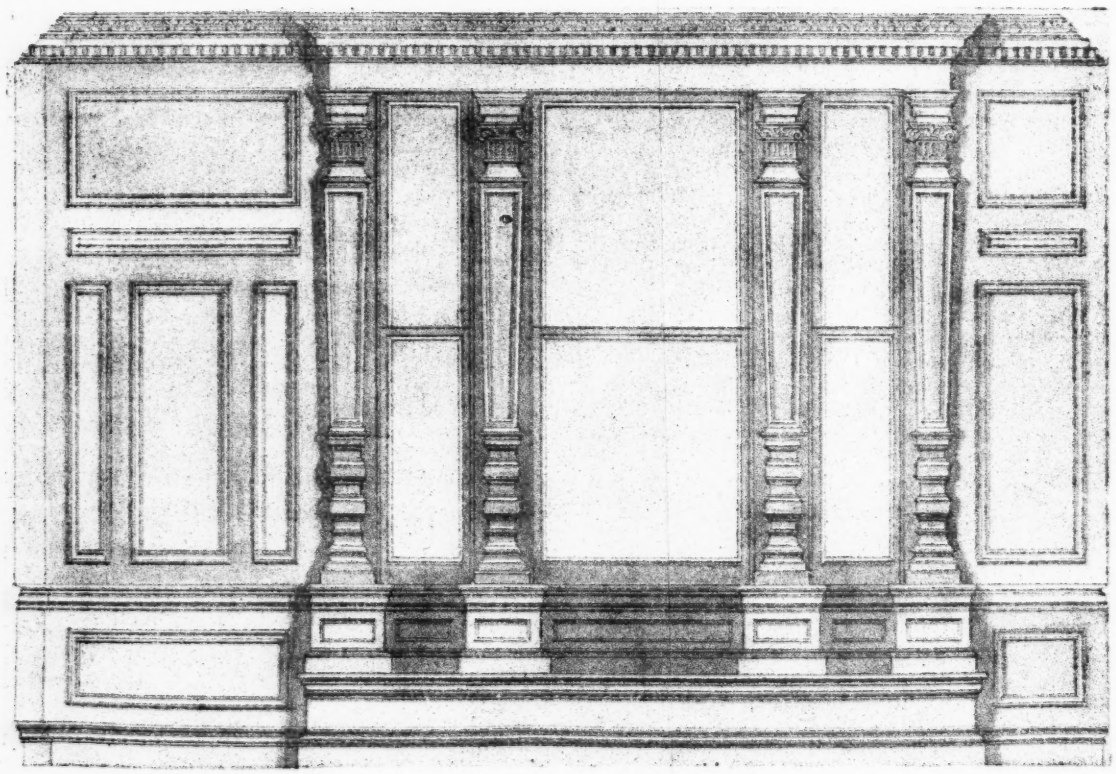

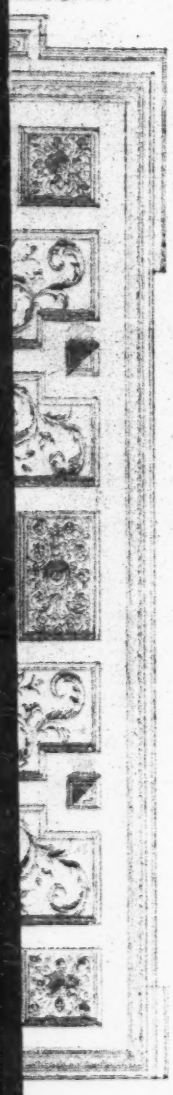

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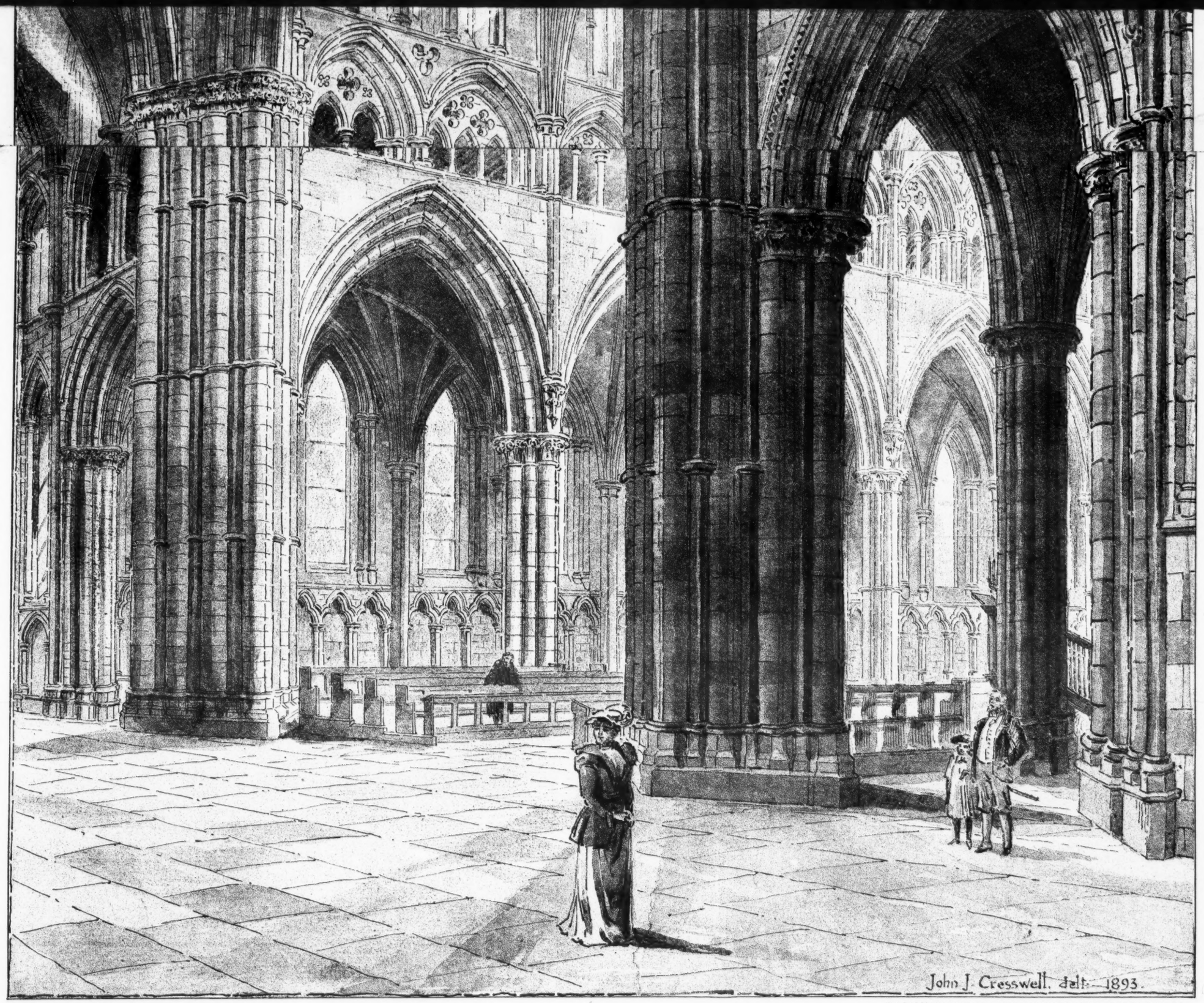

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